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BLUE PRINTING MACHINERY

G&O
Radiators
New Haven
12TH YEAR

12
L.A.A.

State Authorities Make an Issue of Speed Advertising

Motor vehicle administrators explain motives which led to resolution condemning recent trend in automobile copy.

Factory executives are divided in their views.

By Robert L. Cusick

"THE practice of a well-known watch manufacturer of showing in his advertisements a watch inclosed in a cake of ice is not interpreted by the public as a suggestion for all owners of such watches to store them in the ice-box overnight."

This is the reply of one prominent automobile sales executive—a factory official—to a question which has recently been brought to a head by the motor vehicle administrators of 14 states, the District of Columbia and two Canadian provinces. The question deals with the propriety of stressing speed in automobile advertising.

As everyone familiar with the subject knows, references to speed have been made in automobile advertising since the first automobiles were announced for sale. As an example, an advertisement of the Pierce Motor-ette published in 1902 states in sizable type that the speed is 25 m.p.h.; that, together with the claim that the car, a run-about model, is an "unrivalled climber," is the only sales talk used. Winton, in the same year, led off its advertising with the statement that it had received first award "in the official speed trials." Numerous other examples of early "speed" advertising are at hand.

But now, with the practice officially condemned by motor vehicle adminis-

trators with jurisdiction over states which go to make up the most important market area in the country, the automotive industry for the first time faces what might be characterized as an issue on the matter, although the action of the administrators has no legal backing and its effect depends entirely upon the course which the automotive manufacturers choose to follow; they can take it or leave it alone.

The condemnation of speed advertising by the state officials took the form of a resolution which was adopted at a meeting of the Eastern Conference of Motor Vehicle Administrators held at Cleveland, Ohio, on May 17. The text of the resolution, which was offered by E. Austin Baughman, commissioner of motor vehicles for Maryland, is reproduced herewith. Explaining why the resolution was offered, Mr. Baughman, in a letter to *Automotive Industries*, says:

"I have always felt that too great emphasis of speed was a mistake in that the reaction of drivers is apt to be to test out their cars and to take too great pride in their ability to pass 'everything on the road,' or to boast of their ability to go from one place to another in less time than others.

"Beginning a number of years ago, I suspended the driving right of Ralph Mulford in Maryland fol-

RESOLUTION

Whereas: There is to be noted in the National Advertising of a large majority of the automobile manufacturers of the United States a growing tendency to emphasize the speed of their machines as a selling point, and

Whereas: Such emphasis mentions the ability of the automobiles to attain rates of speed far in excess of any legal limit permitted in any State of the Union, and

Whereas: The reaction of many purchasers of motor vehicles to this emphasis of speed as a desirable feature of their car is to test the manufacturers' assertions, therefore

Be it Resolved: That the Eastern Conference of Motor Vehicle Administrators go on record by formal vote as decrying the over-emphasis being placed on speed in the advertising by the manufacturers, and urge that other points of merit of the cars be stressed, and

Be it Further Resolved: That each member-state's representative in the Conference, upon return to his respective jurisdiction, give publicity locally to this action by the Conference, and that, in addition, the Secretary of the Conference mail a copy of this resolution to the National Automobile Chamber of Commerce, the Ford Motor Company, and the Canadian Automobile Dealers' Manufacturing Association.

Text of resolution condemning speed advertising, adopted by Eastern Conference of Motor Vehicle Administrators at Cleveland, Ohio, May 17

lowing a speed test which he conducted against one of the crack trains of the Baltimore & Ohio Railroad between Baltimore and Washington. Since then I have on numerous occasions suspended the driving licenses in both endurance and speed tests.

"Testing out of motor vehicles by the manufacturer on the test tracks of the company, on privately-owned property, is a development of automotive manufacture, but I feel that such tests as one recently conducted on the public highways of Pennsylvania, over Uniontown Hill, should be prohibited, and commend Registrar of Motor Vehicles Eynon (of Pennsylvania) for his action in suspending the license of the driver of this vehicle and reprimanding the automobile company. Certainly the advertising of such speed tests as this is to be condemned."

Desiring to develop as fully as possible the viewpoint of the Eastern Conference members on this subject, with the thought that many automotive executives would be interested in a thorough threshing out of the case, we queried a number of the other state officials who participated in the Cleveland meeting.

Further reference to the Uniontown Hill incident, mentioned by Mr. Baughman, is made in the letter from Benjamin G. Eynon of Pennsylvania, who says: "We in Pennsylvania are very much opposed to advertising by automobile manufacturers emphasizing the speed of their products as a selling point, and all of the member states of the conference concurred with Colonel Baughman in the adoption of his resolution.

"Only recently extensive advertising was given to the fact that the Studebaker Commander topped the Uniontown Hill, Uniontown, Pa., at 60-mile speed, smashing all records. Without any investigation other than the newspaper comments and advertisements by

Eastern Conference of Motor Vehicle Administrators

List of Member-States and Representatives

MAINE Edgar C. Smith, Secretary of State.	NEW HAMPSHIRE John Griffin, Commissioner of Motor Vehicles.
QUEBEC, CANADA J. A. Begin, Comptroller of Provincial Revenue.	ONTARIO, CANADA J. P. Bickell, Registrar of Motor Vehicles.
MASSACHUSETTS George A. Parker, Registrar of Motor Vehicles.	VERMONT Charles T. Pierce, Commissioner of Motor Vehicles.
CONNECTICUT Robbins B. Stoeckel, Commissioner of Motor Vehicles.	RHODE ISLAND Geo. R. Wellington, Chf. Clk. Motor Vehicle Department.
NEW YORK Charles A. Harnett, Commissioner of Motor Vehicles.	NEW JERSEY William L. Dill, Commissioner of Motor Vehicles.
PENNSYLVANIA Benjamin G. Eynon, Registrar of Motor Vehicles.	OHIO Chalmers R. Wilson, Commissioner of Motor Vehicles.
MARYLAND E. Austin Baughman, Commissioner of Motor Vehicles.	DELAWARE Charles G. Grantland, Secretary of State.
DISTRICT OF COLUMBIA W. H. Harland, Director of Traffic.	VIRGINIA James M. Hayes, Director, Division of Motor Vehicles.
NORTH CAROLINA Sprague Silver, Motor Vehicle Supervisor.	

the Studebaker people, we suspended the operating privilege of the driver of the car which made this speed. Our law is very specific in providing that 'No person shall participate in any physical endurance test or any race or speed contest with a motor vehicle on any highway'."

In justice to the Studebaker Corp. it should be stated that during the test in question every precaution was taken to insure a clear road while the run was being made and although strictly according to the Pennsylvania law, the procedure was illegal, it was certainly countenanced at the time by legal authorities. Among the spectators was the mayor of Uniontown himself, and the accuracy of the speedometer used in the test was certified by Pitts-

burgh police. The test was made just at daybreak, when traffic was at its lowest ebb. The company's greatest sin, apparently, was in advertising the event.

Reaction Coming, Says Harnett

Charles A. Harnett, commissioner of motor vehicles for New York, is of the opinion that "eventually there will be a reaction on the part of sober, sensible people to this attempt to sell automobiles based on their speed-making ability, and we believe that it will have a very harmful effect in causing youthful drivers to attempt to develop these cars on the highway to their maximum speed." Continuing, he says:

"We further believe that the conservative purchaser of cars will eventually give up driving unless something is done to curb the speed of automobiles, since we are in a position to state with accuracy that speed is responsible for 80 per cent of all automobile accidents. Recently in this state we revoked the licenses of two drivers who advertised the fact that they drove automobiles on the highways of this state at a rate of speed



These clippings are reproduced to show a form of advertising that is particularly opposed by the motor vehicle administrators. The copy is based on records established on the open highway by maintaining speeds in excess of the legal limits

in excess of that maintained by the Empire State Express, the crack train of the New York Central Railroad. After the revocation of these licenses both individuals admitted in signed statements that the advertising containing these statements was false and misleading and that no such test actually took place.

"Perhaps I have been the pioneer in this movement (against speed advertisements) and I am happy to say that I have had very sincere cooperation from Alfred Reeves, manager of the National Automobile Chamber of Commerce, as well as from various far-seeing manufacturers, particularly from George M. Graham and Walter P. Chrysler."

George A. Parker, registrar of motor vehicles, Massachusetts, states: "I believe that this was an extremely timely and proper action on the part of the conference, as the matter of calling to the attention of the public the possibilities of speed in automobile advertising naturally has a psychological effect which is unfavorable to safety on the highways."

A somewhat different view from the others is held by Commissioner Robbins B. Stoeckel of Connecticut. Mr. Stoeckel is a member of the conference but did not attend the Cleveland meeting and therefore did not vote on the resolution. He says: "I do not personally think speed emphasized in advertising carries a great deal of weight, for nowadays the speed of a car in any of the well-known makes is taken for granted. Every buyer knows that the engine and the general theatrical characteristics, as I like to call them, of every car are all right up to the full extent which the strain of his pocketbook will stand. What I have personally been trying to induce, and what I think the policy of the conference must be, is that in sales arguments for cars, both in advertising and in demonstration, emphasis be made on the safety factors of the car as well as on the show points."

Having thus summarized the views of some of the conference members and outlined the motives which led to the adoption of the Cleveland resolution, we can revert back to the opening paragraph of this article and trace from there the reaction of the automobile manufacturers to the suggestion that speed advertising is harmful to the public and should be soft-pedaled.

The reference to the watch manufacturer and his cake-of-ice appeal comes from Paul G. Hoffman, vice-president, Studebaker Corp. of America. Mr. Hoffman, as might be surmised, is one of a group of automobile executives who believes that speed advertising is in accord with sound business practice. He says: "Present-day merchandising demands presentation of the proof of the quality of a product in a forceful, dramatic way. We have known full well the extraordinary endurance built into our cars, but we have also realized

AUBURN

Breaks All Stock Car Records

For 24 hours and all intermediate times and distances

No Other Stock Car Has Ever Travelled So FAR, So FAST

July 1st, on Atlantic City Speedway
under direction and supervision of A. A. A. An Auburn
Model 115 Stock Speedster, Powered by Lycoming—

BREAKS ALL STOCK CAR RECORDS—

for 1 to 24 Hours!
for 1 to 2000 Miles!

2033 miles in 24 hours, averaging

84.7354 m.p.h.

Beating Former Record by 9.113 m. p. h.

This car was equipped with a high compression head and 3-4 valve motor which is equipped with wire wheels and 6-ply tires, including side, which are optional equipped stock car in its class.

Why?

To sell speed? No!
It is unlawful to drive 100 miles an hour.
And you do not want to average 84 miles an hour.
But it proves ENDURANCE and VALUE, and that was the purpose of this test.

A car capable of this observed sustained speed and endurance has every part, combined in quality.

PERFECT PERFORMANCE
During this entire 24-hour
Auburn car
after—

FLAWS MEAN FAILURE
A car one iota less strong, or one iota less perfectly designed and built, could not withstand this grueling strain.
If any one of several thousand parts in the car had not been absolutely correct and reliable, it could have proved this cheering demonstration of endurance.
There is no sign of performance for the
Think how indestructible a car will be when it is forced to travel that way.

This advertisement, as H. C. Hersh, advertising manager, Auburn Automobile Co., explains, advertises speed without trying to sell it. After raising the question of why the test was conducted the copy says: "To sell speed? No! It is unlawful to drive 100 m.p.h. And you do not want to average 84 m.p.h. But it proves endurance and value and that was the purpose of this test."

that the only way we could translate the stamina to the public in terms which could be readily understood was to institute tests unparalleled in automotive history.

"The advertising of these tests can no more be taken as an invitation to the public to use the speed of which these cars are capable than the practice of the watch maker can be interpreted as a suggestion that all watches be kept in ice.

"The ability of a car to withstand such tests as we have made proves more conclusively that any other method we know of the advanced design of the car and the high quality of the materials and precision workmanship entering into its construction."

Moskovics' Views Similar

A view similar to this was expressed some time ago by F. E. Moskovics, president of the Stutz Motor Car Co. of America. Mr. Moskovics argued, as Mr. Hoffman has argued, that speed is one important criterion of a car's ability to give safe and enduring service under ordinary driving conditions, and that it is almost impossible to convey this thought to the public in a convincing manner unless some indication of the speed possibilities is given in the advertising. Speed, Mr. Moskovics contends, is an index to engineering progress; a car which is capable of 90 or 100 m.p.h. must be so well built that it is ultra-safe at any speed usually attained by the ordinary driver.

What is probably as near to a solution of the problem of how to advertise and yet not try to sell speed is found in the present policy of the Auburn Automobile Co., as explained by H. C. Hersh, advertising manager, and exemplified in recent Auburn advertising, of which

a specimen is reproduced herewith (preceding page).

"We do not sell speed when we advertise the breaking of stock car records," says Mr. Hersh. "It is unlawful to drive 100 m.p.h. Neither does the public want to average 84 m.p.h. for 24 hours, but the ability of a car to travel 100 m.p.h. or average 84 m.p.h. for 24 hours proves endurance and value. That is the reason for our stock car runs and the advertising of the results.

Policy Will be Continued

"It has been and will continue to be the policy of the Auburn Automobile Co. in advertising the setting of a new stock car record to draw the attention of the public to this fact. When we recently advertised the new record of 84 m.p.h. for 24 hours we told the public that such speed proves our product capable of many years of average use and that the breaking of records was merely incidental. Whenever in the future we make use of similar advertising copy we shall again tell the public that such records are set up merely to prove the soundness and stamina of our product."

The automotive industry, however, does not by any means present a solid front in defense of speed advertising. Not a few of the members of the National Automobile Chamber of Commerce harbor sentiments on the subject in accord with those of the Eastern Conference.

Here, for instance, is how C. A. Triphagen, sales manager of the Reo Motor Car Co., feels about about it: "We have used speed in our advertising copy on several occasions but I do not like it. No doubt we have been prompted to refer to speed in some of our copy because of the more or less general use of the same appeal by others in the industry. If speed could be played down more than it has in the past I believe it would be a benefit. I am in sympathy with the movement which has been started by the motor vehicle commissioners."

And William W. Lewis, director of advertising and assistant sales manager of the Cadillac Motor Car Co., says: "Once or twice we have made reference to speed but we have no desire to promote high speed. Cadillac and La Salle cars are big and powerful and naturally have speed. But after all speed is just one of many factors which the modern motor car buyer considers when he purchases a new car.

No Monopoly on Speed

"No manufacturer has a monopoly on speed. Speed is very dangerous. We do not like to promote speed and I think it would be beneficial if more attention was paid to stressing more thoroughly many of the other important factors which are equally interesting to the prospective buyer."

A number of other companies hold the same view. The Packard Motor Car Co. is against speed copy in its advertising. It has consistently refrained from speed publicity and in all probability will continue to do so.

Since during the past two years reference to speed has crept into the advertising of the lowest as well as the highest priced cars, even Ford having made rather free use of the word in his introduction of the Model A, the statement of J. E. Grimm, Jr., advertising manager of Chevrolet, may be of interest, especially as he lists the appeals upon which the Chevrolet advertising program, the largest in the industry, is based. He says: "The Chevrolet Motor Co. does not believe in stressing speed any more than any other factor which the public demands in the car of today. Our job is to appeal to the multitude, and for that reason our copy fluctuates on the following eight points, which after all are the factors the public looks for in any motor car: (1) Good

appearance; (2) snappy performance; (3) ease of handling; (4) riding comfort; (5) economy; (6) dependability; (7) high resale value; (8) all the above features at the lowest possible price."

Aside from mailing copies to all of its members, the N.A.C.C. has taken no official note of the Eastern Conference resolution. A spokesman for the chamber states that there has been no pronounced reaction to the resolution among automotive manufacturers so far as he is able to see, and gives it as his opinion that the resolution came after the trend toward speed advertising had practically run its course. He thinks the motor vehicle commissioners fashioned a padlock for the stable after the horse was stolen. And a survey of recent automobile advertising pretty well bears out this contention.

There has been in recent months a marked decrease in speed advertising copy. A year ago, it must be admitted, the word "speed" was running rife through newspaper and magazine pages and the situation at that time drew comment from several well-known persons. Capt. E. V. Rickenbacker, chairman of the Contest Board of the American Automobile Association, was one who expressed a feeling that continued use of the speed appeal might result in a nation of speed-conscious motorists with a consequent increase in the number of road accidents attributable to too fast driving.

Wave is Subsiding

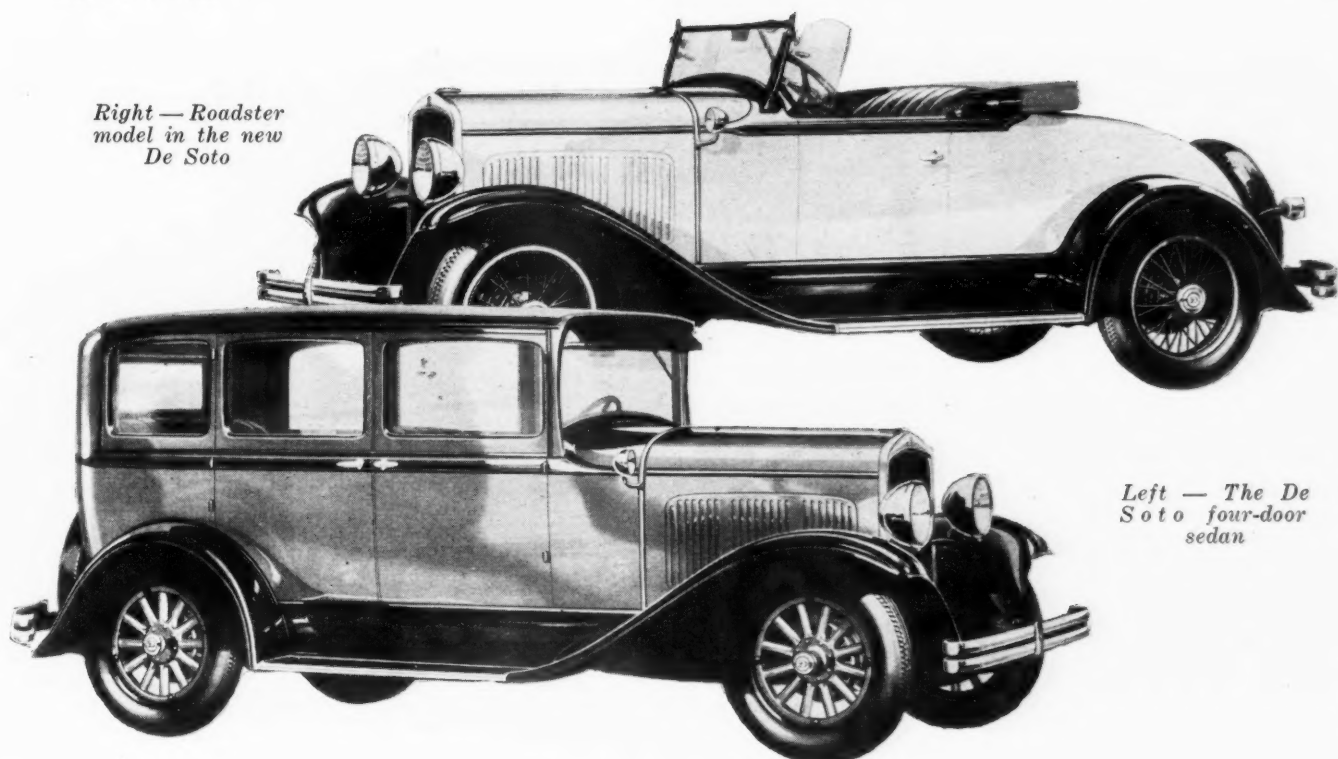
With a view to determining the amount of speed copy that is being used at the present time, an inspection was made just before writing this article of three late issues of a national weekly magazine which is regarded as a favorite medium of automobile manufacturers. In the first issue were the advertisements of six companies; four of them rested their cases with no reference at all to speed while the other two mentioned it without emphasizing it. In the second issue only one out of nine companies which advertised saw fit to place speed among the leading features. In the third issue eight advertisements were read without finding any impressive mention of speed.

Possibly the Eastern Conference resolution has had something to do with this decrease in speed advertising; that is possible but not probable. The real answer seems to be that the copy writers have simply exhausted one appeal and are off hot on the trail of another. And this time it is style that predominates both illustrations and text. This is rather significant, too, in view of the fact that practically every new model that has been introduced so far this year has a more powerful engine, and consequently more speed, than the model it superseded.

So if speed advertising has diminished it isn't because less speed is available in the cars.

THE controlling interest in the Unionwerk Mea, Feuerbach, and in the Mea Vertriebsgesellschaft, which has been in the hands of the German General Electric Co., has passed to the Robert Bosch Co. The two Mea companies manufacture and distribute automobile electrical equipment and it is stated in the announcement concerning the change in ownership that the two firms involved had come to the conclusion that the available market in Germany for electrical equipment for automobiles was much too small to enable two firms of their size to operate economically. In addition to magnetos, generators and starters, the Mea firm has been manufacturing ignition cables and this branch of the business will be taken over by the General Electric Co.

Right — Roadster
model in the new
De Soto



Left — The De
Soto four-door
sedan

New De Soto Reflects Chrysler Engineering Practice

Seven body styles offered at prices ranging from \$845 to \$885. L-head engine has piston displacement of 179 cu. in. and develops 57 hp. at 3000 r.p.m.

By A. F. Denham

THE De Soto, Walter P. Chrysler's latest production, is revealed this week as a moderate-priced six with attractive body lines and a number of advanced engineering features.

Body styles (with Spanish designations) and prices so far announced are as follows:

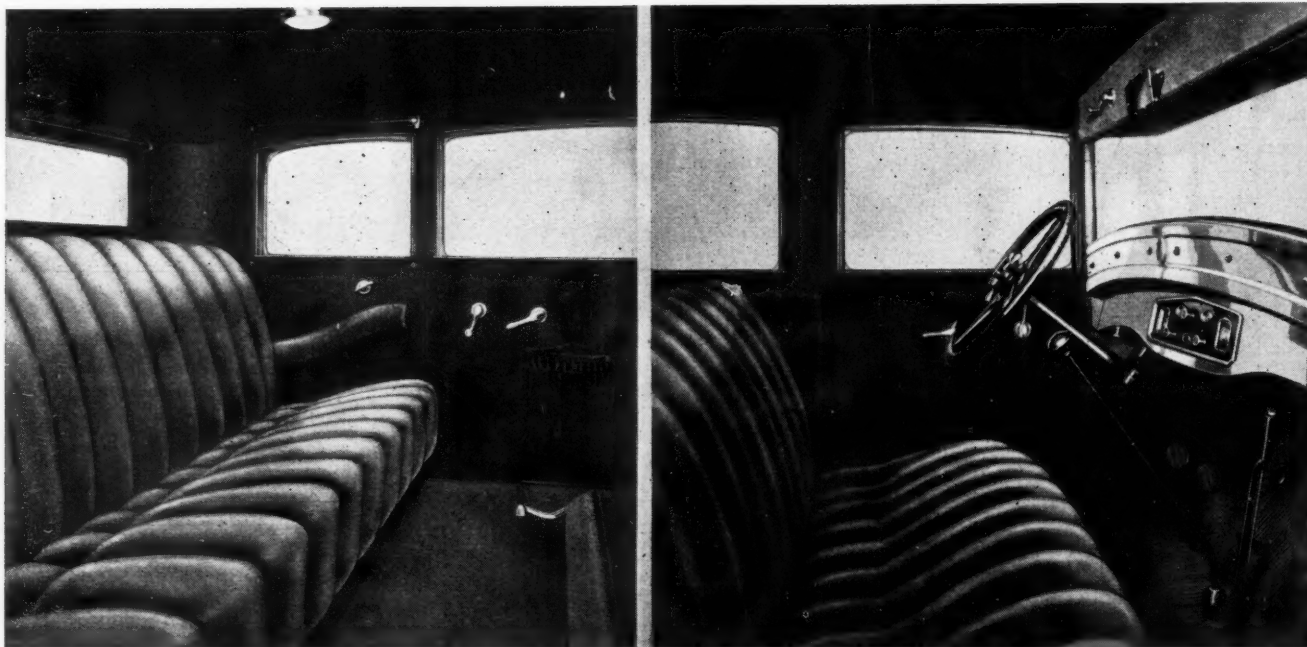
Sedan de lujo	\$885
4-door sedan	845
2-door sedan	845
2-passenger cupe	845
Business cupe	845
2-4-passenger cupe de lujo	845
2-4-passenger roadster	845
5-passenger phaeton	845

Previous Chrysler engineering practice is predominant in the design, and among the chassis features are found Lockheed four-wheel expanding brakes, the system including the self-compensating self-refilling master cylinder found on other Chrysler cars; thermostat-controlled water circulation, rubber engine suspension and Nelson Bohnalite pistons. Self-adjusting Tryon metal shackles, a counterweighted crankshaft, an oil

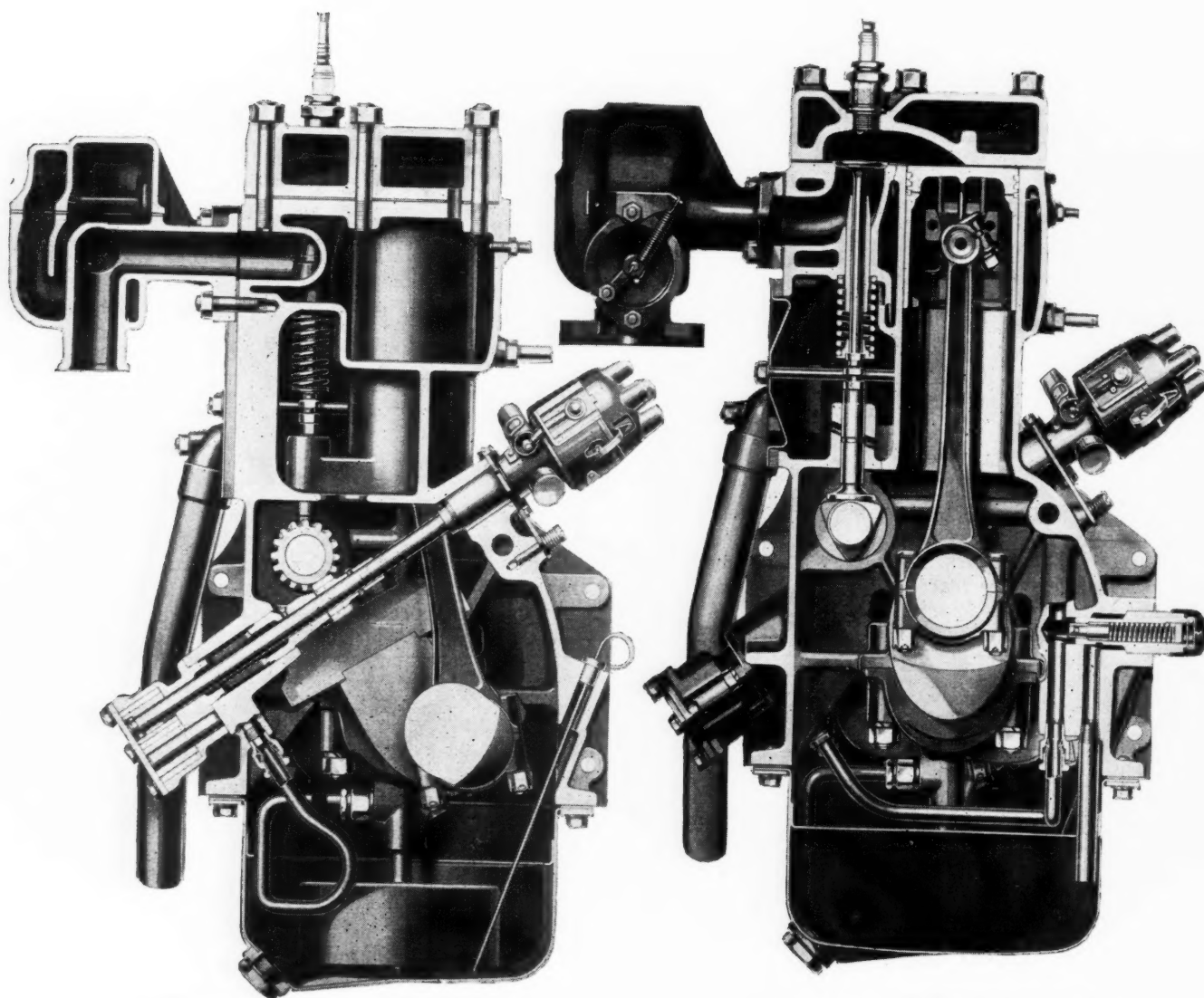
filter, an air cleaner, and a crankcase ventilating system are also features of the new chassis.

Body lines are shown by the accompanying photographs. Viewed from the front, the radiator shows a high narrow core, a narrow shell, and shallow header tanks at top and bottom. The impression usually created by the addition of a false bottom is here achieved by making the bottom header tank extend below the shell rather than above it. At the top of the radiator is a flush-type filler cap with central ridge blending into the hood hinge. Viewed from the side the shell is of the narrow type, the hood overlapping the radiator core proper, to give the appearance of greater hood length from the dash forward. With this design the filler cap mounting extends in the form of a flush type plate through the top front center of the hood. All of these exposed metal parts, together with the headlamps, cowl lamps and bands, tail light, and door handles, are chrome-plated. On the de luxe models this also applies to the arched tie rod between the headlamps. Hood latches, on the other hand, are cadmium plated.

Long, sweeping, full-crowned fenders and a fairly



Front and rear compartments of De Soto sedan



*Cross-section through engine showing
oil pump and distributor drive*

*Cross-section showing valve, piston
and connecting rod*

short running board completely shielded by aluminum moldings add to the impression of length. Cheat lines in dark colors along the bottoms of the side panels also contribute, and seem to bring the roof closer to the ground. Window frames and window glasses both are arched.

Much attention has been paid to comfort. Seats are exceptionally low but by careful design ample leg room is obtained. Mohair upholstery is standard on the closed models. Felt padding is used both on the dash and under the floor mat to insulate the front compartment from the engine against both heat and noise.

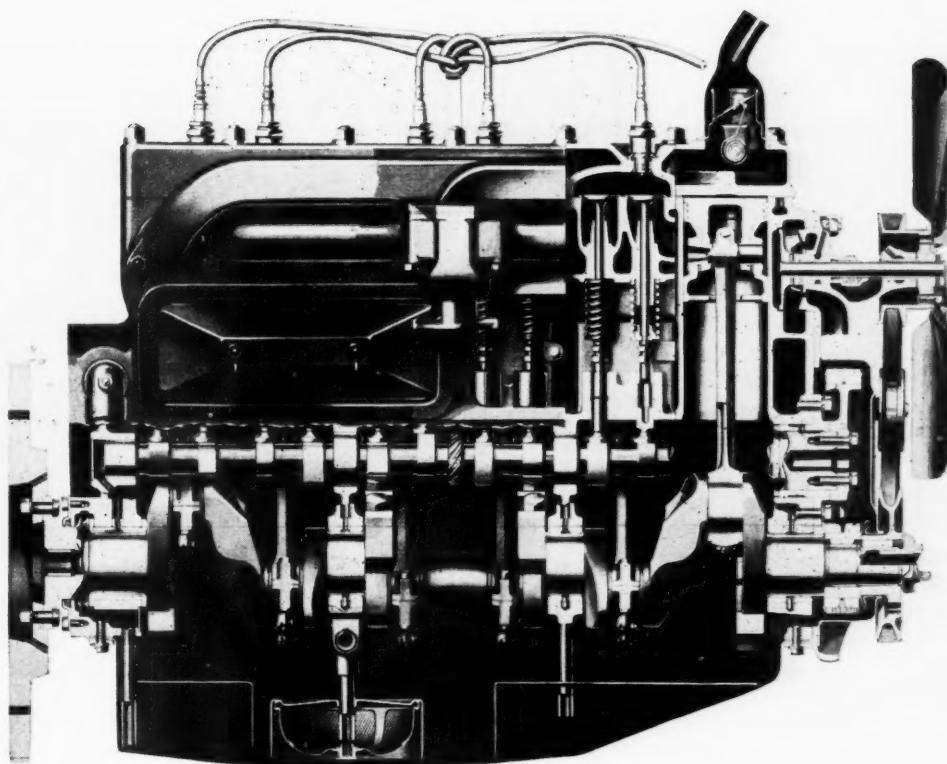
Simplicity is the keynote of the instrument panel, which has a black field in the standard models with individual glass for the instruments. Fedco number plates and an Electrolock are provided for theft protection. Sedans have door pockets. Steering wheels are of the hard rubber composition type. In the coupe models the dash is colored to match the exterior finish. In other models contrasting color schemes are used.

Windshield wings are standard on the roadster, which also has a single-piece swinging windshield with chrome-plated brackets. De luxe editions of these cars will also be offered. In addition to the regular equipment these will come with six wire wheels, the spares mounted in fender wells, the fenders themselves being lacquered in colors; a chrome-plated tie rod, a finer grade of upholstery, onyx gear shift lever ball, etc. As optional equipment on the standard body lines, five wire wheels are available at an extra cost of \$35.

Cylinder dimensions of the L-head engine are 3 by $4\frac{1}{8}$ in., giving a piston displacement of 174.9 cu. in. With the standard of 5.2 to 1 head, a maximum of 57 hp. is developed at 3000 r.p.m. At 30 m.p.h. the engine turns at 1600 r.p.m.

A 58-lb. crankshaft, $2\frac{1}{4}$ in. in diameter, is carried in four main bearings with lengths of $1\frac{5}{8}$ in. for the front, $2\frac{1}{4}$ in. for the rear, and $1\frac{1}{4}$ in. for the intermediates. It is fitted with four counterweights to reduce the main bearing leads and has an overall length of slightly less than 31 in. Thrust is taken on the rear bearing. An unusual feature is found in the considerable reduction of centrifugal forces on the crankshaft by the use of crankpins of relatively small diameter ($1\frac{7}{8}$ in.). Crankpin journals are $1\frac{1}{4}$ in. long and the alloy steel connecting rods are centrifugally babitted. The rods have a center to center length of $8\frac{15}{16}$ in., equal to more than twice the stroke, and are provided with a clamp to lock the piston pin in the rod. The pins have a diameter of $\frac{3}{4}$ in. and bear directly in the Nelson Bohnalite pistons.

The latter have an overall length of $3\frac{11}{16}$ in. and weigh 0.81 lb. They are fitted with three rings, the upper two being of the tongue and groove type as used on Chrysler cars, and the lower being of the oil regulating type. Oil rings are $\frac{1}{8}$ in. wide.



Longitudinal section of De Soto engine

The camshaft, like the crankshaft, is supported on four bearings, the front one being of the removable bushing type, $2\frac{1}{16}$ in. in diameter and 1 in. long. Integrally machined on the center of the camshaft is the helical gear for driving the distributor and oil pump shaft. Valve tappets are of the chilled cast-iron mushroom type, and are adjusted to have a clearance of .004 in. for the inlet and .006 in. for the exhaust valves, when the engine is hot. Chrome nickel steel is used for the inlet and Silchrome for the exhaust valves, both of which have a clear diameter of $1\frac{5}{16}$ in., a seat angle of 45 deg., a stem diameter of $11/32$ in. and a lift of $5/16$ in. Both have removable stem guides. Combustion chamber design follows usual Chrysler engineering practice. An option is given on a Red Head 6.2-to-1 compression head.

Silent Chain Camshaft Drive

Camshaft drive is by means of a silent chain. An accessories driveshaft extends through the crankcase at an angle of about 45 deg., the lower end of which connects to the oil pump and the upper end to the distributor head at the opposite side of the engine block. The oil pump is located outside of the crankcase, for accessibility. Oil is fed under pressure through drilled passages in the crankcase to crankshaft main and camshaft bearings, and through the drilled crankshaft to the crankpin bearings. Baffle plates are fitted in the crankpan to prevent flooding of the front end under rapid deceleration.

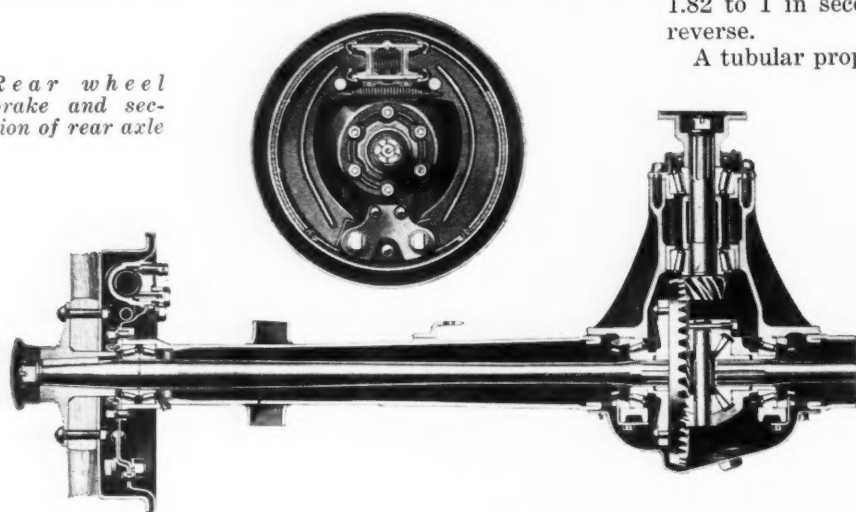
The oiling system also includes an oil filter and a crankcase ventilating system. The oil capacity is 6 quarts. Oil pump driven gears are of bronze.

Cooling is by a centrifugal pump located in the forward end of the cylinder head and mounted on the fan-shaft which is driven by a V-belt. This belt also drives the generator at the left side of the engine. Belt adjustment is made by means of the generator mounting. As mentioned, a thermostat is located in the cylinder head water outlet. A cellular type radiator is used, and

the water capacity of the cooling system is $2\frac{1}{2}$ gal.

A vacuum system of Kingston manufacture and an 11-gal. fuel tank are included in the fuel system. The carburetor is of the Stromberg plain tube type and incorporates an accelerating plunger pump; it has a ver-

Rear wheel
brake and sec-
tion of rear axle



tical 1-in. outlet and is provided with an inertia-type air cleaner. Manifolding is of conventional two-piece design, the exhaust manifold having its outlet at the front end, and jacketing the center of the inlet manifold, a by-pass valve near the outlet being provided for heat control.

Electrical units are all of Delco-Remy manufacture, the distributor having 15 deg. manual and 25 deg. automatic advance. Starter engagement is by Bendix drive. Metric spark plugs are used.

The cylinders and crankcase are cast integral. Heavy longitudinal ribbing is provided at the right side of the crankcase for stiffening. Rubber mounting is used for the engine, this being of the same type as that recently adopted on the "Plymouth," with the rubber in tension rather than compression.

Combined with the engine are the single plate clutch of $8\frac{7}{8}$ in. diameter and fitted with a triangular rubber insert, and the three-speed standard transmission. In the latter ball bearings are used for the mainshaft and plain bushings for all other bearings. Gear ratios are 1.82 to 1 in second, 3.04 to 1 in low and 3.65 to 1 in reverse.

A tubular propeller shaft, 2 in. in diameter, with electrically-welded forged ends, is fitted with two ball and trunnion type metal universal joints. The rear axle is of semi-floating design with a reduction ratio of 4.7 to 1. Shafts are $1\frac{3}{8}$ in. in diameter and the thrust is taken by the Timken wheel bearings, Timken bearings also being used for mounting the differential and the pinion shaft, the latter being carried on two opposed taper roller bearings.

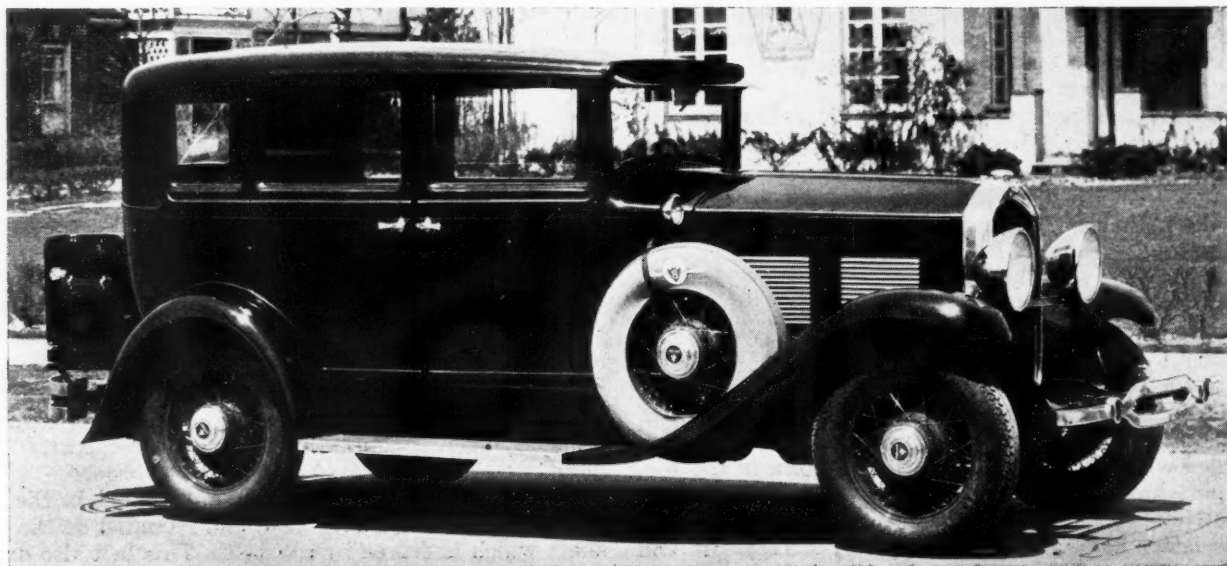
Front axles have reverse Elliott ends and an I-beam center section. Timken wheel bearings are used here also, while a ball bearing is used for thrust in the direction of

the knuckle pin axis. Brakes are similar in design to those used on the Chrysler 65; they have 11-in. drums and shoes fitted with $1\frac{1}{2}$ in. lining of molded composition. These brakes are supplemented by an emergency brake on the propeller shaft, having a 7-in. drum and 2-in. band width.

Springs are semi-elliptic all around, with lengths of $35\frac{1}{2}$ in. for the front and $53\frac{1}{2}$ in. for the rear, both being $1\frac{3}{4}$ in. wide. They are fitted with Tryon shackles.

Included in the standard chassis equipment also are Lovejoy shock absorbers, a 90 amp.-hr. Willard storage battery, twin-filament headlight bulbs, cowl lamps, and a combination tail and stop-light. All models also carry an automatic windshield wiper, a dash gasoline gage, a rear view mirror, and a Fedco number plate. Sedans have dome lights, robe rails and foot rests.

Jordan's New "Air Line Eight" Sedan



This sedan de luxe in the Jordan Air Line Eight series, announced a short time ago, lists at \$2,095 fully equipped. Price without de luxe equipment is \$1,995. Two other body styles, a five-passenger two-door victoria and a two-passenger convertible-top coupe, are included in the line

Just Among Ourselves

New Blood Needed in Ranks of Dealers

ZONE men for some of the factories are coming to believe more and more that the industry has got to develop a greater number of new dealers per year in the future than in the recent past; that this new blood is needed and that the old game of merely exchanging dealers, or rather, taking dealers away from a competitor, is getting harder and harder for all concerned. A man coming in with a fresh viewpoint, they say, isn't nearly so much handicapped by the traditional troubles and he usually brings a vigor and intensity of interest to the particular car he is selling that is not nearly so characteristic of the man who has sold eight or 10 different makes in his time.

* * *

Prejudice of Bankers Must be Overcome

BUILDING up distribution points on this basis, of course, these men who have that job on their hands admit, is slow and certainly can't be relied on exclusively as a practical matter. They do feel, however, that along that line lies the permanent road to greatest success, particularly for the smaller companies. One of the big obstacles in many cases is, not only that of finding the man, but of getting the support of local, small-town bankers. Even when a man has a fair amount of his own capital and is reasonably well sold on getting into the automobile business, he almost inevitably consults his bankers concerning the pro-

posed move before making it. Many bankers are favorable, to be sure, but the experience in a good many instances during the last few years has been that the average banker, particularly outside the big cities, has not yet been sufficiently sold on consistent, permanent profit possibilities of an automobile dealership. One of the best ways manufacturers can help to sell this banking group, of course, is to build up more dealers who can be held up as a shining examples of the constructive possibilities of the business.

* * *

Building for Long Haul Essential to Sound Growth

SOMETHING of this kind, naturally, is the objective of every car builder. But too frequently in the past some manufacturers have permitted their factory situation to get to such a point that they had to make moves to meet immediate conditions which were not in line with a permanently sound policy. The first essential to building a sound automotive merchandising plan, one successful executive told us the other day, is, in his opinion, to get a 10 or 20-year view of the company's possibilities. Then, he says, it becomes clear that all but moral practices must be eliminated or at least recognized as compromises and as methods definitely to be washed out at the earliest possible moment. "Every policy designed to gain a merely temporary end," he said, "provides a definite resistance to growth. That fact is too little recognized."

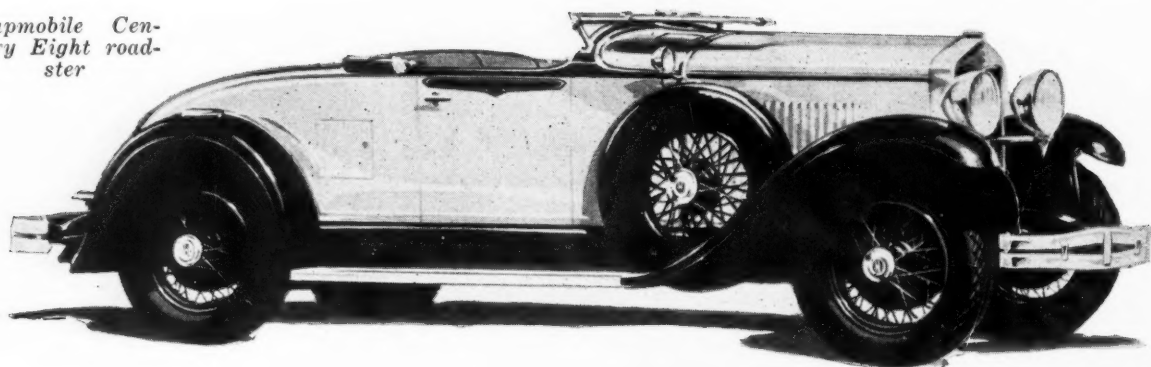
Getting Employees to Explore Their Jobs

AS we go about the industry, we find one problem which seems to be common to almost every executive having supervision of any large number of men. "It isn't so hard to deal with incompetence," we find executives saying over and over again; "that can be eliminated fairly easily by replacement of the man. The difficulty is with those men who are doing their jobs about 80 per cent efficiently. Replacement might bring about a worse situation. Yet the business in many ways is seriously hampered by the lack of mental energy which makes most men fall into routine and apparently leaves them without the power of looking for the real significance in every piece of the day's work."

* * *

Significance of Job Should be Realized

As one man put it the other day, "The real problem of the automotive executive today is that of rousing the average satisfactory employee to an exploration of his job. He must be able to stimulate his assistants and departmental workers to look for significance in everything they do; to explore the possibilities of their jobs; and to strive actively to fulfill those possibilities." That was an interesting point of view to us. And as we thought it over, the task appealed to us as one to be accomplished by a multitude of daily actions on the part of the executive even more than by the occasional general presentation and discussion which apparently would be a necessary part of the program as well.—N. G. S.

Hupmobile Century Eight roadster

Hupmobile Adopts Double Spring Shackling

*Shackle at rear of left front spring is designed to reduce "wheel fight."
Other changes made for 1929.*

DETAILED refinements in both chassis and body characterize the Hupmobile line for 1929. General body lines and mechanical design continue unchanged. Prices for the standard line continue unchanged, but prices of special equipment, including five or six demountable disk, wire or wood wheels, have been changed. The option of demountable wood wheels will come into effect in about a month.

Improvements in both cars include the adoption of Monroe hydraulic shock absorbers, a new line treatment for the splash pans, etc., and improved interior equipment. Externally the bodies have been dressed up by extending the gas tank cover over the spring horns. The front splash aprons and pan also have been extended over the spring horns, and both are curved and grooved to better harmonize with the body lines.

Inside the cars are found new instrument panels of oxidized bronze finish in the eight and oxidized silver in the six. There are individual openings in the panel for the faces of the instruments and gages. The gages



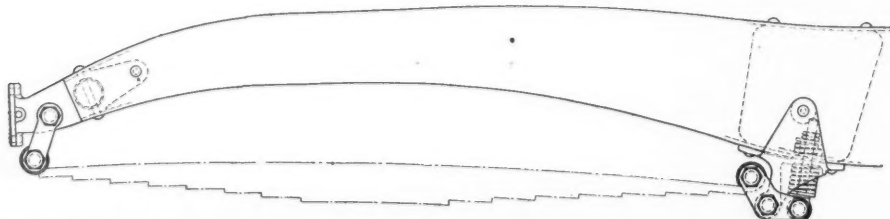
Hupmobile's new instrument panel with revolving dials

are of the horizontally revolving dial type, similar to speedometers, and are a product of the Sterling Mfg. Co.

Another departure in interior finish is the use of a single escutcheon plate on each door for mounting the remote door control handle and window crank. They are finished to harmonize with the instrument panel. Four-passenger coupes on both chassis now have the belt molding carried around the back of the rear deck as on the roadster and the cabriolet. Closer fitting tops are used on the touring models. Cabriolets are now equipped with a dome light. On the two-door sedans right front seats (left front for export) have been changed from a bucket type to a folding type. Larger hubs and hub caps are fitted to de luxe demountable wood and disk wheel equipment.

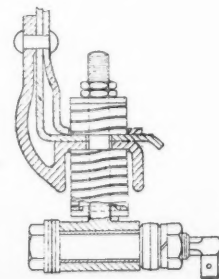
Body changes applying to the six-cylinder models include the adoption of a dash engine thermometer and Electrolock. On this chassis, headlights and tail-light are now chrome-plated on all models. Toggle grips have been added in all closed models. An improved visor is also found.

On the eight-cylinder bodies a chrome-plated and improved trunk rack is now standard. On this chassis a number of mechanical changes have been made. The most interesting of these is the double shackling of the left front spring (right for export). In addition to the regular spring shackle at the front end, the rear is now also fastened to a shackle, the center of which is pivoted to the bracket below the frame channel and the rear end of which has a bolt extending at right angles verti-



Arrangement of left front spring on Hupmobile eight, with flexible mounting at rear end

Detail of front spring rear shackle



cally upward through the lower frame channel flange, compression springs being placed both above and below the frame flange.

The object of this device, which is used to some extent in Europe, is to reduce what is commonly known as "wheel fight." This phenomenon is encountered in normal design, especially with efficient steering gears, when the left front wheel (right for export) strikes an obstruction, or roughness in the road. It was found that by permitting the entire left wheel, axle and spring assembly to move forward and back under such conditions, this characteristic is eliminated. The rear shackle is therefore so designed that the rear end of the spring can travel forward and backward in a small path, this motion being controlled by the compression springs already referred to, which are set with a fairly light initial compression.

The adoption of this device has made possible an increase in steering gear ratio from 15 to 1 to 16½ to 1 without increasing the sensitivity of the gear to road-shocks. For the same reason it has been possible also to decrease the distance between the knuckle pin and wheel center, thus bringing the center of tire contact more nearly below the steering pin, resulting in reduced tire wear and in greater ease of brake application. The latter is enhanced by a change in the leverage which reduces the braking effort at the pedal.

Auto-Lite ignition units have been adopted on the eight-cylinder Model M.

Connecticut Traffic Study

ANOTHER study of motor vehicle accidents in the State of Connecticut has been completed for the Hartley Corp. by Richard Shelby Kirby, this latest study having to do with the experience of 1926 and also with trends evidenced since 1923.

The general nature of the findings are clearly indicated in the forward to be published report by Robbins B. Stoeckel, commissioner of motor vehicles. Mr. Stoeckel writes, "Considered in comparison with Connecticut statistical studies of former years, it is plain that general conditions governing motor vehicle accidents are becoming more and more intensified and that there is no very great trend, at least as yet, toward improvement.

"It might be argued with considerable force that education and discipline are just about keeping pace with increasing traffic hazards and that, therefore, any betterment depends on securing a more intensified public sentiment, which in turn will compel more thought to be given to the devising and execution of remedies."

The first section of the report presents 12 charts which graphically picture the present trend in motor vehicle accidents. Here we find that accidents are increasing in number but at a trifle lower rate; that deaths decreased during 1926 for the first time in four years; that the number of persons injured continues to increase rapidly and that the property damage bill is mounting steadily.

An encouraging sign is that in spite of increasing car density the accident rate (accidents per 1000 cars) has been declining for two years. The increase in the number of accidents has been at about the same rate in the smaller towns as in the cities. In proportion to their population the smaller towns have slightly fewer accidents than the cities but nearly twice as many deaths.

To emphasize the importance of motor vehicle accidents several comparisons are given with the ravages of certain dread diseases and we find that during the

five years preceding 1926 there were, in Connecticut, 207 deaths from typhoid fever, 843 deaths from diphtheria, but 1415 deaths from automobile accidents. Older persons are being killed at a still more rapid rate than was true in past years but the situation in respect to children is improving, there being 40 fewer children and youths under 20 killed in 1926 than during 1925.

The automobile injury rate (persons per 100,000 population) has nearly doubled in four years, a total of 35,000 persons having been injured during the last five years. Of the persons injured in 1926 about one-third were children and youths under 20, the rest were adults. The estimated annual damage from motor vehicle accidents during 1926 was nearly \$2,400,000 and it is pointed out that the State Capitol cost only a bit more than two and a half million.

Property Damage Estimated

In a detailed investigation of the type of accidents occurring during 1926 a number of interesting items of information were disclosed. The average property damage per accident, not including accidents involving personal injury only, was about \$121 and 36.9 per cent of all involved sums greater than \$100. Nearly two-thirds of the accidents were on good road surfaces with almost half occurring at intersections. More than half took place in broad daylight with a decided peak at about 5 p. m.

A study of the ages of over 40,000 drivers involved in 24,326 accidents during 1926 shows results not varying greatly from those obtained in 1924 and 1925. The accident rate decreases as the age of the driver increases, for drivers under 20 years it being four times that of drivers over 50. In about 60 per cent of the cases the car was driven by the owner, in 20 per cent by an employee and in 17 per cent by a friend.

In evaluating the accident rate by groups of cars it was found that the rate for buses increased more than 80 per cent in 1926 over 1925 and they showed over one accident per bus during 1926. The taxicab rate, while not nearly so high, increased 60 per cent over 1925 and has trebled since 1924.

Causes of accidents remain about the same as in previous years an analysis of some 3500 collisions with pedestrians indicating that 42 per cent were caused by carelessness of a child; 32 per cent by the carelessness of an adult and 19 per cent by the carelessness of the driver. Of the cases of driver carelessness by far the largest were due to inattention.

In all the 24,326 accidents during 1926 74.3 per cent were the fault of the driver, 11.8 per cent that of pedestrians, 9.0 per cent were caused by some other contributor, while but 3.4 per cent were caused by defective equipment.

Of these last cases steering gears and brakes are the most prolific cause of trouble with glaring headlights, insufficient light and blowouts figuring importantly.

TOWNE Scientific School of the University of Pennsylvania has issued a bulletin of its one-year course in fuel engineering leading to the degree of Master of Science in Fuel Engineering. This is the second year of the course which covers fuel resources, mining methods, preparation for market, distribution, storage and rehandling; composition and combustion of fuels; manufacture of special fuels; uses of fuels and specifications for purchase; furnaces; fuel sampling, analysis and calorimetry; fuel testing in heating and power appliances; domestic heating, cooking, smoke elimination; regulations affecting use of water power and of fuel resources; research, electives.

Ability to Sell Ideas *Essential* to *Engineer's* Success

Knack of getting along with others in daily work and an understanding of the economic phases of management also generally regarded as major requirements.

ABILITY to get along with others in daily work, ability to sell ideas to the management and to the sales department, ability to understand the economic as well as the technical phases of the management problem, and willingness to accept full responsibilities for his own difficulties and actions are four important characteristics needed by an automotive engineer if he is to gain financial success in his chosen profession, in the opinion of numerous leading engineers of the industry. There is a strong general feeling among these leaders, also, it would appear, that a definite reciprocal obligation exists for the general executive representing the management to try to understand and appreciate certain inherent values in certain engineers whose personal sales ability may be permanently underdeveloped.

A fairly general agreement among important engineers as regards the points outlined was evidenced pretty clearly a few weeks ago by the discussion which followed the presentation at the summer meeting of the Society of Automotive Engineers, held at Quebec, Can., of a paper by Norman G. Shidle on "The Engineer as a Business Man," in which much interest was shown.

The very practical part played by tact—the ability to get along with other people and to transfer one's own ideas to another with minimum friction — is emphasized repeatedly in both the oral and written discussion. H. W. Alden, vice-president and chief engineer, Timken - Detroit Axle Co., stresses this point especially, when he mentions "tact" as one of the five elements essential to business success and then adds:

"Years ago I used to place this element pretty well down the line. The older I grow, however, the further up the line I place it. If we stood all the automotive engineers up in a line and measured them with a rule for this element of tact, I wonder what would be the result?"

The same thought is stressed by a specific example cited by Walter T. Fishleigh, engineer, Ford Motor Co., who tells of a conference in which he sat a while

back which had to do with the work of a chief engineer in entire charge of the engineering department of a company. "The question came up," Mr. Fishleigh said, "as to what they could do with that engineer. He was particularly good technically and from a strictly engineering standpoint. There was no question about his ability if he didn't have to deal with other men. The question, in spite of all this, was what would have to be done with that engineer, even to the point of removing him from his position. One executive suggested that it would be better to get an engineer who didn't know one-tenth as much about technical engineering and who knew a lot more about salesmanship, general policies, human nature, teamwork and cooperation."

That this matter of exercising tact is just about as much an integral part of the engineer's job as is designing automotive products is emphasized by J. H. Hunt, Chevrolet Motor Co., who points out that a lot of engineers just don't like the trouble of meeting situations which call for the exercise of this quality. He relates an incident of a man who had come to him and said "I could very easily have gone on with that job which I just resigned if I had been willing to call on a

certain man, pass the time of day and flatter him a little bit." Mr. Hunt did not blame this man for not wanting to do that, but adds: "I do think in this particular case that he rather evaded responsibility when he didn't do it. Doing it was just a part of the job of finding the opportunity to put his viewpoint across. It wasn't very pleasant, but it simply had to be done and if he didn't want to do it he couldn't do the rest of the job successfully."

The necessity for thinking in management terms and in terms of commercial and economic aspects of the engineering job is brought out specifically by a number of the technical men, notably O. E. Hunt, chief engineer, Chevrolet Motor Co.; E. P. Warner, Assistant Secretary of the Navy for Aeronautics; K. L. Herrmann, consulting engineer, Studebaker Corp., and E. P. Blanchard, Assistant Sales Manager, Bullard Machine

THE complexity of modern industry has brought about an interdependence and a need for closer relationship between the technical and non-technical branches of any company far greater than ever existed before.

The engineer's relation to other elements in the automotive field seems to *Automotive Industries* to be one of the important factors in this constantly changing situation.

Further comments on the subject will be welcomed.

Tool Co. Their comments contain much of interest.

In such a market situation as the automotive industry now finds itself, O. E. Hunt believes, "technical, production and selling factors all have to be considered carefully to arrive at the best commercial compromise and stimulate a maximum public interest in the product. We are in a competitive business that requires the engineer, if he is to be broadly successful, to be about as good a business man as he was an engineer before the war, and as appreciative of the sales and production problems of his own organization as previously he was of its technical problems."

Miss the Commonsense View

F. C. Horner, assistant to the vice-president, General Motors Corp., too believes that "splendid engineers oft-times fail to make good with their managements because they cannot or will not try to see the management's or what might better be termed the commonsense view of the problem. The engineer's ideas must fit into the business picture—which means that he can at least listen to the other fellow's arguments and be humble enough to study the requirements in the field and on the ground as well as in the laboratory and test room; such an engineer, if other things are anywhere nearly equal, will make his mark and will be a joy and an inspiration to his associates and to those who use what he engineered into existence."

T. J. Litle, Jr., chief engineer, Marmon Motor Car Co., believes that while "many engineers are technically fog-bound because they refuse to read or discuss anything except that pertaining to their own profession, there is no reason why the activities of the engineer should be limited to his particular profession. "We must expect," Mr. Litle says, "to see trained engineers occupying the chief executive positions in our industry as many are already doing; for after all the engineer is a trained thinker and is admirably adapted to a variety of occupations."

E. P. Warner considers that an understanding of this economic function of business is even more important to the engineer than understanding of the psychological side. "It is the inescapable burden," Mr. Warner thinks, "or at least a responsibility of every engineer in every line of employment—except perhaps in pure research where the term engineer is applied only in a specialized sense—to understand the application of, and the possible market for, the product on which he is working, and to consider it as an economic, even more than as a technical, problem."

Something of this same idea is reflected in the statement of Mr. Blanchard that "there is too strong a tendency on the part of an engineer, whether he be design or production engineer, to aim for an ideal set-up for what we may term 'pure science' where the last degree of refinement is not practically justified either in the

way of cost financing or of market conditions. A fuller understanding of business," Mr. Blanchard says, "will help the engineer to compromise. Instead of cramping his style, it will help him to make his style practical and to make his ideas right from a business point of view."

The suggestion that the average engineer is too conscientious is advanced by Carl Breer, executive engineer, Chrysler Corp. He says: "The average engineer is so conscientious that in most cases he lacks salesmanship to put his ideas across. The result is that he is buffeted about and unsold on his decision for fear of a solution not being 100 per cent correct. There is a marked distinction between a theoretical ideal of meeting a situation 100 per cent and that of a commercial ideal that may only call for a 95 per cent answer."

One of the best ways that an engineer can go about broadening himself in the business field, in the opinion of John Younger, Ohio State University, is by studying and applying the principles of practical psychology. "Far too many engineers," Mr. Younger feels, "are guided by purely technical engineering reasons. They do not always realize the vast complexity of the organization for which they are working and they may make engineering changes which have a vast economic reaction on the whole structure." This thought is further emphasized by the statement of C. A. Musselman that "automotive engineering in the present highly competitive automotive market means designing something which will add to the prestige and reliability of the product and incidentally prove to be something which is salable and permits reduction of production cost."

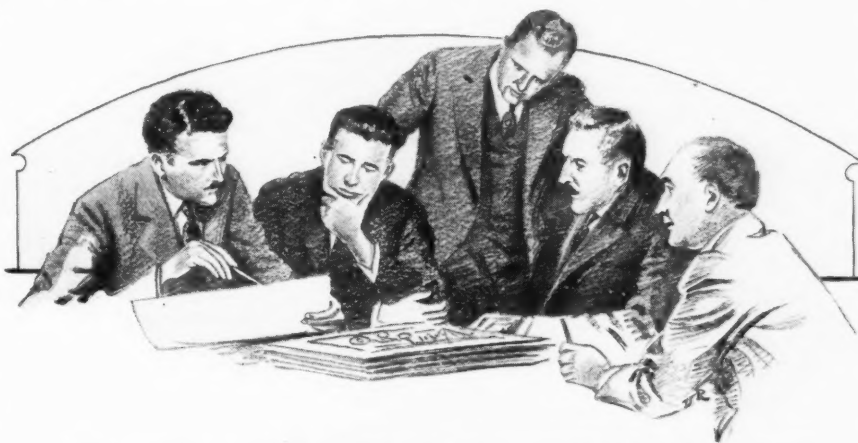
Part of Operating Organization

K. T. Keller, vice-president in charge of production, Chrysler Corp., also visualizes the successful modern engineer as an integral part of the business in which he works. "In former years," he says, "the automotive industry was more or less dominated by the sales department; possibly that situation developed an inferiority complex in the average engineer. But today the

engineer designs a product along standardized lines in cooperation with other divisions of the organization. In other words, changes were often made in former years because the changes supplied good sales talks, whereas now changes are the results of sound engineering and the sales arguments are incidental. Hence the engineer is part

of the operating organization and should enter into all manufacturing business problems where the design reduces or increases cost."

K. L. Herrmann sees the engineering department of a motor car manufacturing company as a commercial enterprise in which all of the functions of a business are carried on. The products are drawings, specifications, models. The work necessary to produce these are stud-



"The engineer ought to be able to sell a good idea as well as a lawyer; to make a convincing, kindly sort of presentation, so that when he gets through, if he has proposed that two times three is six, the public and the management may agree with him"

ies of style, construction, competition and expense; drafting, pattern making, foundry and machine shop work. There is, too, the matter of personnel and appropriation of funds, very similar to that of any normal business. Finally, the customers of the engineering department are the sales manufacturing and directing divisions and, indirectly, as in the case of many other commodities, the public. "In engineering as in business," Mr. Herrmann says, "incompetence—not including inexperience—and improper allotment of capital, equipment and personnel available, may be responsible for failures. Bradstreet reports 5.2 per cent of all failures due to inexperience after incompetence, lack of capital, etc., have been allowed for. This may be an indication that special knowledge concerning a line of business is the smallest factor in its failure and in one way we might reason that technical knowledge is a very small part in the success of an engineer, important as it may be."

Ideas Must be Conveyed

Prominent engineers seem to agree that an idea in the mind of a technical man usually isn't of very great practical use unless it can be conveyed to the minds of executives in other departments in a satisfactory and probably convincing way. As Mr. Fishleigh puts it, the engineer ought to be able to sell a good idea as well as a lawyer; to make a convincing, kindly sort of presentation so that when he gets through, if he has proposed that two times three is six, the public and the management may agree with him. This common lack of ability to convey an idea, J. A. C. Warner, assistant research engineer, Studebaker Corp., finds, has resulted in a peculiar concept of an automotive engineer in the minds of dealers and salesmen who have to sell the product which the engineer designs. Early this year, Mr. Warner had an opportunity to work among the sales forces in the field for about three months and he found that most dealers felt that the automotive engineer was some sort of sleight-of-hand artist and that was about all. "They didn't believe," Mr. Warner says, "that there was such a thing as an engineer who could talk to ordinary everyday people and have them understand him. They felt that the engineer was really a peculiar breed of cat that really ought to be put off in a class by himself. It is up to us engineers to change that idea," Mr. Warner concludes.

Obligation of the Executive

Finally, while practically all the leading engineers of the industry feel that the engineer should accept full responsibility for doing his entire job as regards the commercial and psychological as well as the technical element, there is an equally strong feeling that a reciprocal obligation toward the engineer exists on the part of the general executive. That this obligation is accepted by successful executives is indicated by the statement of Henry M. Crane, technical assistant to the president, General Motors Corp., regarding the way in which A. P. Sloan, Jr., president, General Motors Corp., operates. "Mr. Sloan graduated from Massachusetts Institute of Technology in 1895," Mr. Crane points out, "but disclaims the fact of being an engineer. But Mr. Sloan is an engineer in the only sense that means very much, and that is based on the definition of engineering after all being nothing but trained common sense with a background of technical information.

"Mr. Sloan's success in business," Mr. Crane believes, "rests on the fact that, by his own force, he is able to convince his subordinates of the right thing to do, and when they are once convinced, not by telling them so,

but through the conviction of their own mental processes, they go and do it. No man in a responsible position can convey his direct impression more than one step down; he may be able to order a man directly under him to do a certain thing and keep close enough watch to see that he does it, but if he orders him to see that a third man does it in a certain way, it probably won't be done properly unless the intervening man believes fully with his boss as regards the right way to do it."

This reciprocal responsibility for understanding on the part of the executive was stressed by E. P. Warner when he said: "There are a good many men who conceive ideas of the greatest value and whose ideas ultimately get accepted through force of circumstances who, unfortunately for themselves and for others, lack and are unable to develop the right psychology or the right personality or the capacity to sell. It seems to me that there is a very definite responsibility on the business man to become also an engineer and to get the engineer's viewpoint so that he will be capable of ferreting out the merit, where there is real and outstanding merit, even though there exists on the part of the original proponent of an idea an inability to put forth that idea effectively and dramatically."

New Diamond T Trucks

THE DIAMOND T MOTOR CAR CO., Chicago, has brought out two new truck models—a 2-ton job designated as Model 400 and a 2½-tonner known as the Model 502.

Both models are powered with six-cylinder engines, have Lockheed hydraulic four-wheel brakes, cam and lever steering gear and other features designed to give long service and easy handling.

The smaller engine is 3¼ by 4½ in. and develops 66 hp. at 2400 r.p.m. The larger engine has a 4 in. bore, the same stroke as the smaller model and develops 74.5 hp. at 2400 r.p.m.

Both engines have seven bearing crankshafts; molybdenum steel wrist pins 1⅞ in. in diameter; cast iron pistons with four rings; pressure lubrication by means of a gear type pump to main and connecting rod bearings; Filtrator oil purifier; Zenith carburetor; air cleaner and governor.

The Lockheed four-wheel brakes are of the internal type. The unit transmission has four forward speeds ranging from 5.2 to 1 in first to direct in fourth speed. The heavy-duty, worm gear Timken rear axles provide ratios of 7¼ to 1 and 8 2/3 to 1 on the Model 400 and 7¼ to 1 and 9 1/3 to 1 on Model 502.

The semi-elliptic springs are aided, in the rear, by six leaf helper springs. The load is carried to the rear springs through special hangers of Diamond T design which eliminate the use of spring shackles. Drive is taken through radius rods.

The radiator is of copper tube and fin construction, the flat tubes being partially resistant to bursting by frost action. The nicked radiator shell is spring fastened to the frame. Cooling is by means of a centrifugal water pump.

Standard wheelbase for the 2-ton model is 163 in. Two wheelbases of 163 and 173 in. are available in the larger model. Optional wheelbases at extra cost range from 141½ to 188 in.

Special equipment includes a steel cab shock insulated by three-point rubber mounting which can be used as a full open, half open or fully inclosed cab to meet all weather conditions.

Oil Cooler is Built in Flywheel

Design as used on Chenard & Walcker Co.
light road tractor in France also
acts as automatic purifier

By W. F. Bradley

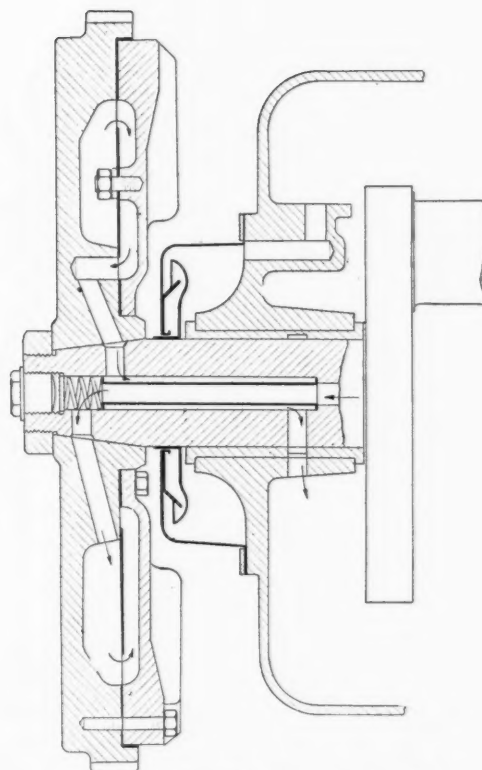
A FLYWHEEL oil cooler and purifier is one of the outstanding features of an improved type of light road tractor built in France by the Chenard & Walcker Co. The flywheel is in two parts, bolted together, as shown in the accompanying illustration, the rear portion consisting of a steel forging, and the forward portion being an iron casting with radiating fins. When the parts are bolted together they form a chamber between them which is divided into two compartments by a sheet steel disk.

Mounting of the flywheel on the tapered and ground end of the crankshaft gives an oil-tight joint. Oil from the crankshaft is led into the rear portion of the casing, as shown in the illustration. It is driven outward by centrifugal force and passes around the baffle plate to the forward part, from which it returns to the crankcase by a return oil passage concentric with the inlet passage.

Contact with the walls of this flywheel results in an effective lowering of temperature. It is stated that, whereas without this cooling system bearings sometimes seized when the tractor was hauling heavy loads up steep gradients, with its use no such bearing failures occur.

A further advantage of this system is that the oil is automatically purified. Centrifugal force drives all solid matter outward and in contact with the periphery of the chamber where it lodges so tightly that it is sometimes necessary to remove it with a chisel. For this purpose the casing has to be taken off the shaft and opened up, but this is only necessary at rare intervals, and to avoid a complete breakdown of the oiling system by reason of the whole of the space around the baffle plate being filled with dirt, a few holes are drilled in the plate to act as a return passage between the two chambers.

The Chenard & Walcker tractor, which has met with considerable success in France, is designed for a wide range of road speeds. With a five-speed transmission it



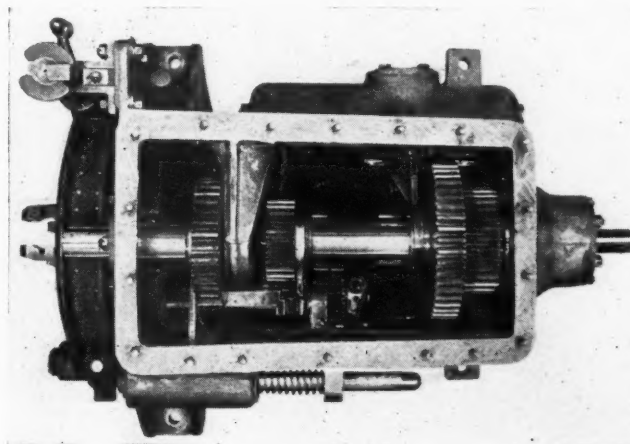
Sectional view of flywheel, showing
chamber for cooling and purifying
engine oil

can haul a useful load of 20 tons at 1 m.p.h., or run light at 32 m.p.h. It is mounted on pneumatic tires and has a wheelbase of 91 in. Power is transmitted through a five-speed gearbox, to a double reduction rear axle with bevel and spur pinions, and provided with a differential lock. The machine is used as a tractor only and is distinctive in having a trailer attachment which enables the load on the driving wheels to be increased at will. A capstan is driven off the gearbox.

MARKED increase in the use of motor trucks for hauling farm produce direct from farms to markets is shown in a survey in New York City which brought out that from 20 to 30 per cent of the supply of leading fruits on the New York market is hauled into the city by motor truck.

This survey, made by the Bureau of Agricultural Economics, United States Department of Agriculture, in cooperation with the New York Food Marketing Research Council, shows that for about three months in mid-season, New York gets nearly one-third of its peach supply by truck; one-fourth of its tomatoes and one-fifth of its apples. Sometimes during the busy season more than one-half the New Jersey produce supply moves in trucks.

The tendency to change from the horse-drawn wagon on the railroad car to the motor truck has been going on for a dozen years.



Five-speed transmission of Chenard-Walcker road
tractor

Electric Furnaces Reduce Dodge Heat-Treating Costs

Quality of product also higher with new installation. Low current consumption results from recuperative system of interchanging heat between hot and cold pots.

SOME rather remarkable records have recently been made on new electric furnace installations for heat-treating at Dodge Brothers, Inc., not only as to more complete automatization and resultant labor cost reduction, but also in quality of product and heating costs.

One of the most interesting of these furnaces is an installation used for carburizing such parts as camshafts, transmission and rear axle ring gears. It is a product of the Electric Furnace Co. and is of the recuperative type. On a test run to determine power consumption, camshafts were carburized to a depth of 0.060 in. and the consumption, based on 1560 lb. per hr., was 16.5 lb. per kw. Total time cycle through the furnace was 32½ hr. 160 kw. windings are used.

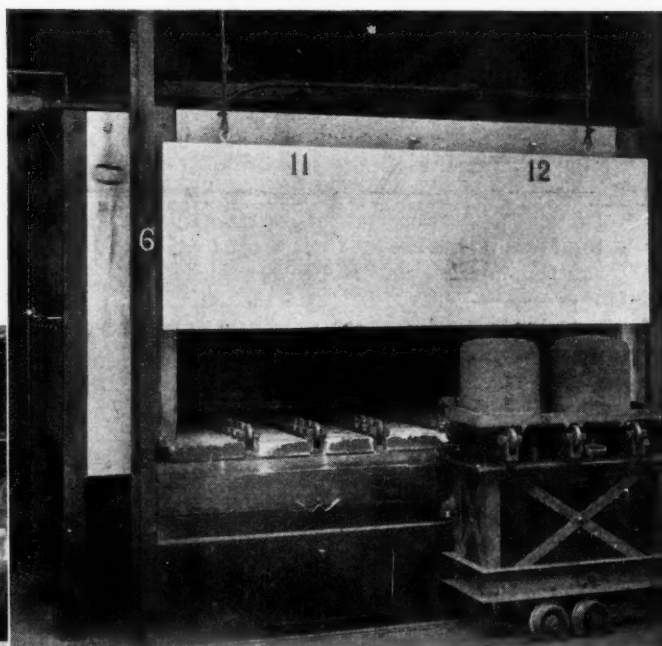
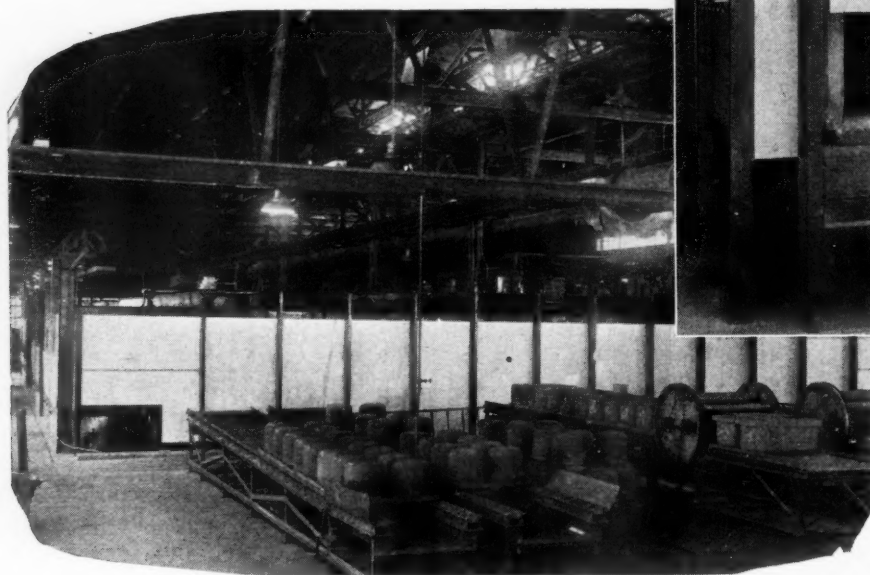
This remarkably low current consumption for this depth of case is largely due to the construction of the furnace. Briefly, the furnace has two sets of three tracks each, feeding in opposite directions, the furnace being loaded from both ends. The chambers in which are located these two sets of tracks are not separated but are closely adjacent to each other to permit of heat interchange between hot and cold pots. Leaving the loading zone, the pots enter the recuperative zone,

which is divided into four stages, each separated to some extent by baffles extending downward from the arched roof.

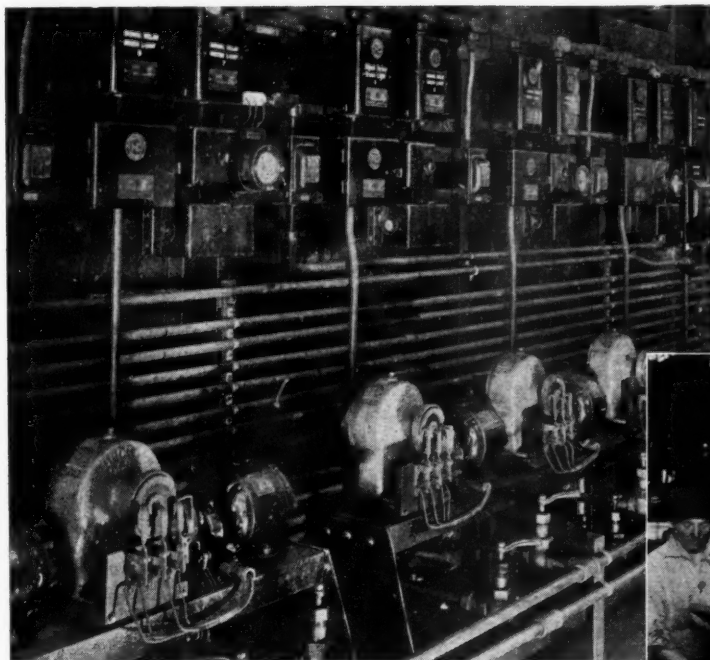
The depth of these baffle walls is such that pots below them virtually form a seal to prevent the radiation of heat in any large amounts beyond these points in the furnace, there being about 1 in. clearance between the top of the pots and the bottom of the baffle walls. With this arrangement there is a very effective heat interchange between the outgoing hot pots and the incoming cool ones in each station between two baffle walls, the curves of temperature rise and drop being very smooth. By the time the incoming pots have passed the last stage of the recuperative zone and enter the heating zone, their temperature has been increased to around 800 deg. Fahr., depending on the length of time cycle. With rear axle ring gears the temperature is roughly 750-800 deg., these having a depth of case of 0.040 and a complete time cycle for the furnace of 19½ hr.

In the heating zone, which is provided with top and

The installation below is used for carburizing Dodge rear axle ring gears. In the background are shown the batteries of Electric Furnace Co. recuperative furnaces. In the left foreground gears are shown being box-cooled. At the right is shown the table for packing the gears in the pots and the turn-over machine

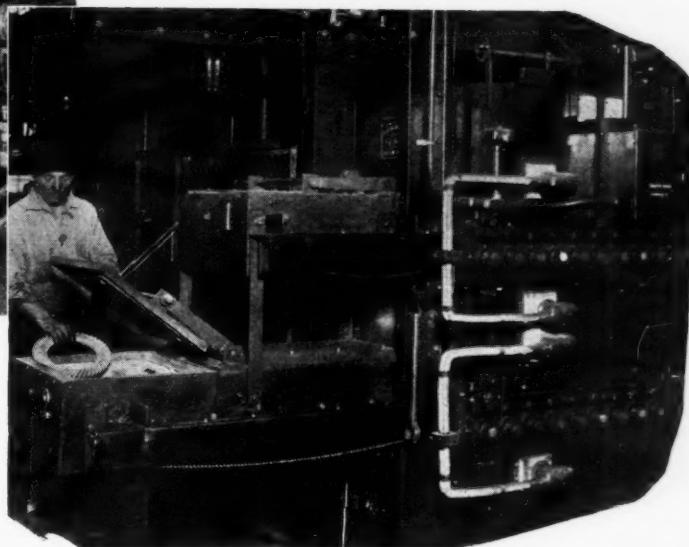


Front view (above) of the carburizing furnace. At the right two pots are shown in position for loading. The pots at the left inside the furnace are on the out-going side. Note roller construction on hand truck riding on rails, to facilitate handling



Control board for the Oilgear pushers for the battery of carburizing furnaces (at left). Each is electrically operated from a clock through a motor-driven rotary switch

Below—Loading end of Electric Furnace Co. hardening furnace for ring gears. Note the external ratchet drive, unaffected by heat. The furnace has two stories for compactness



bottom T-grid elements near the incoming pots, and top elements only over the outgoing, the temperature of the incoming pots is raised to 1650-1660 deg., the actual temperature being controlled by a thermocouple over the outgoing pots to maintain these at 1660-1670 deg., this latter being the temperature at which the pots are held in the next zone, devoted to soaking. This zone is controlled by a couple over the center of the furnace.

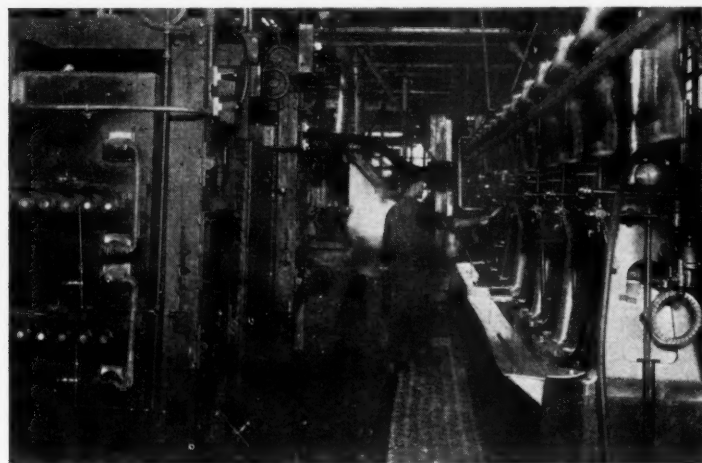
The fourth zone for the gears is a reversal of the second zone, as is the fifth a reversal of the first. In the fourth there is again a separate couple over the outgoing pots, and the fifth zone has no heating elements, but is baffled. Temperature of the pots leaving the furnace is about 900 deg. Fahr.

Radiation from the furnace proper is relatively low. Its sidewall structure contains 4½ in. of fire brick and 12 in. of insulating material. Furnace floors are of three sheets of alloy steel supported by fire brick between the heating elements. Overall length of the furnace is 71 ft., of which 16 ft. represents the length of the loading and recuperative zones, 6½ ft. the heating

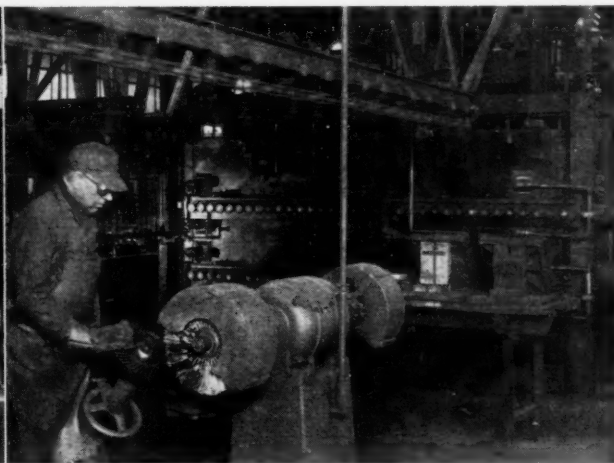
zone while the remaining 26 ft. is the soaking zone.

As mentioned, the pots are supported on three tracks. These ride on alloy roller rails. Hydraulic pushers of Oilgear Co. manufacture are used, these being timed and operated electrically from individual clocks, making contacts for ¼ hp. motors which in turn operate rotary switches through worm gear reductions. Breaking of the circuit is performed by the pushers themselves, which trip the circuit at the end of their stroke.

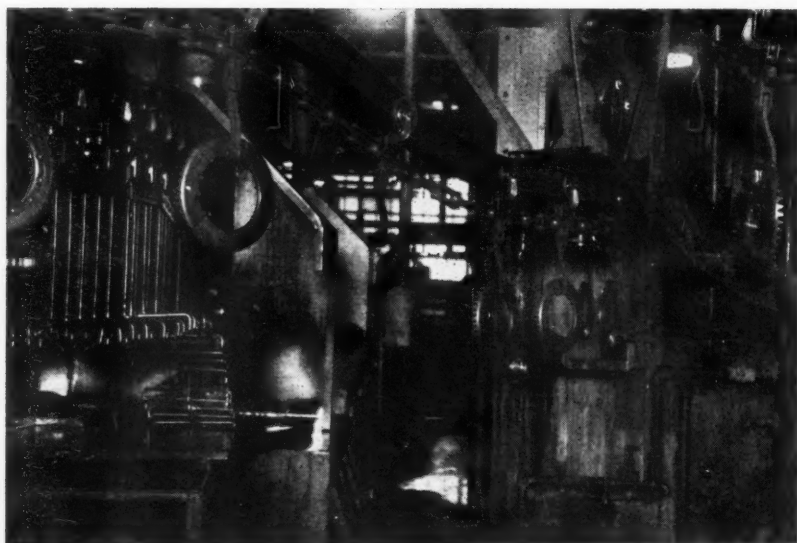
Unfortunately no data is as yet available on the power consumption for carburizing rear axle ring gears. These are loaded 10 to a pot, two pots having one cover, with a total weight for two loaded pots of 540 lb. Since



At the right are shown the battery of Gleason presses for oil quenching ring gears between dies. At the left is shown the discharge side of the hardening furnaces

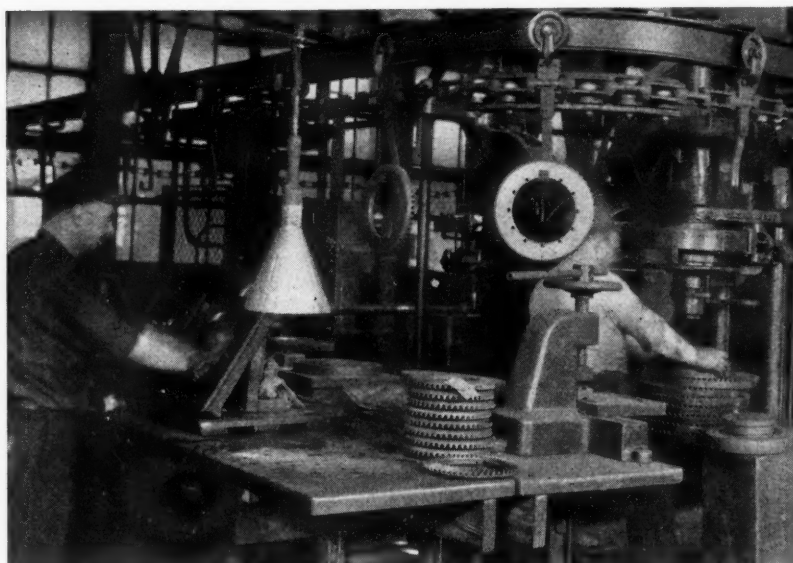


After quenching and washing, gears are wire brushed to remove scale and replaced on the conveyor to take them through the oil draw



At the right (above) is shown the automatic washing machine, and at the left the entrance side of the oil draw bath, which is electrically controlled as to temperature. Oil is circulated in the direction of conveyor travel by means of a motor-driven impeller

Right—Inspecting the finished ring gears for out of round and out of flat. Limits are held to 0.003 in. At the right dies from the Gleason presses are shown being straightened



two pots are loaded from each end every 30 minutes, the production at capacity would be 2160 lb. per hour, with a depth of case of 0.040 in. Average power consumption is estimated at around 25-30 kw. in the holding and 45 kw. in the heating zone, as against a maximum rating of 49 kw. for the holding and 55 kw. for the heating zones. This would give an efficiency of about 18 lb. gross per. kw. To this must be added a 52½ per cent reduction in labor cost over the oil-fired type of furnace.

In this furnace 220-volt three-phase current is used, with one phase to each of the three zones in which are located the heating elements. Recorders are of Leeds & Northrup manufacture.

Following the ring-gears through the other heat-treatment operations, they are next box-cooled for five hours. They are then placed in a second electric furnace to heat them for the oil-quench hardening operation. This furnace, which is also of Electric Furnace Co. manufacture, has two stories for compactness, each a complete furnace in itself. Gears are placed flat in the furnace directly on rolls, the width of the 30-in. rolls permitting the placing of two rows in staggered formation for more even heat absorption. Feeding of the gears through the furnace is by means of external ratchets turning the rolls. The time cycle for ring gears through this furnace is 44 min., of which 36 min. are spent in the heating and 12 min. in the second or holding zone, two zones again being provided to enable separate thermocouple temperature control. About 30 min. out of the 44 min. are required to bring the gears

up to 1430-1440 deg. Production is about 28 gears per hour per tunnel.

Adjacent to the "hardening" furnace are located the Gleason presses for oil quenching. In these the gears are held between dies, and oil is forced in at 120 deg. at 30 lb. pressure, and so directed that the oil will strike the ring gear teeth first, then pass around the outside and up through the center hole and across the back face. By this means a very quick quench with a temperature rise of the oil of only 2 deg., which is the limit set, is obtained with minimum warpage. The oil itself is separately water-cooled or heated, an important point in the preventing of warpage, especially in the winter.

Following the oil quench, ring gears are hung on a conveyor which takes

them successively to the automatic washer, to the wire brush cleaners, and through the oil draw. The latter, also of Electric Furnace Co. manufacture, is interesting in the method of control. Tank capacity is about 1000 gal. and production capacity about 2000 gears. Oil is circulated in the direction of conveyor travel by means of a motor-driven impeller. The oil returns around the outside of the tank, passing over channel section serving as heating elements for reheating, to a point in back of the impeller.

Thermocouples are located in the oil return divisions of the tank for temperature control. Temperature is maintained at 300 deg. Fahr. with a maximum tolerance of 5 deg. About 40 min. are required for a gear to pass through the oil draw.

Finished gears are held to within 0.003 in. for out of flat and out of round; 100 per cent inspection is also used for hardness, this being maintained at just below file-hardness on the tooth surface.

PAASCHE AIRBRUSH CO., Chicago, has developed a Lo-Hi Pressure Feed Airbrush which is said to operate on less than one-half the air consumption required by other standard syphon or gravity feed spraying devices and at one-half to one-quarter the air volume generally required.

Industrial Plants *Abandoning* Many Personnel Activities

Elaborate set-ups established during the war to stabilize floating labor supply are disappearing. Survey shows scope of welfare work in automobile plants.

THE tendency toward simplicity in personnel activities at automotive plants is brought out by a survey made last year by the U. S. Bureau of Labor Statistics. This covered the employee's welfare work in a number of industries but included were 19 representative automobile manufacturing plants, and, through the courtesy of Ethelbert Stewart, commissioner of the Bureau, *Automotive Industries* is permitted to present the information obtained from these plants in more detail than was possible in the published report of the survey.

It is shown that many of the innovations introduced during the war in the effort to stabilize a floating labor supply have been abandoned and that the disposition is to concentrate on the services and conveniences which have proved of real benefit to employees and management.

Four of the 19 plants surveyed, with a total of about 35,000 employees, give vacations with pay to workers on hourly and piece work pay basis. In two of the plants vacations are given to all employees having at least two years' continuous service. A third requires five years' service for vacation while the fourth company gives vacations to employees of 10 years' service.

Pay is usually made the average weekly earnings during the year; sometimes it is given to the employee before the vacation and sometimes upon his return.

In eight establishments having about 46,500 employees the management assisted the employees in maintaining a benefit association. About 90 per cent of the employees of the eight plants belonged to these associations.

Rules governing the form of management, admission to membership, etc., are generally similar. The contribution of the management to the associations varies considerably. In four cases the management paid the clerical cost of the association only. Another pays the clerical cost and also pays the secretary, treasurer and board of directors and gives and maintains a car for the nurse hired by the association.

Management Duplicates Payments

In two more companies the death benefits paid by the associations are duplicated by the managements. In the remaining company the management pays 40 cents per month per member into the association funds.

In only two cases is membership compulsory; two associations require a membership fee and two require a waiting period of one month before admission to membership. Dues vary from 50 cents or less per month in four cases to \$1.40, while in two associations they vary according to the class of membership.

Sickness benefits were between \$7 and \$10 a week in two cases, over \$10 in four cases and for varying

amounts in the other two associations considered.

Six associations pay death benefits which range from \$100 to \$500. Sick benefits begin after the first week in six cases, after the sixth day in one and after the fourth day in another. One association pays benefits for 13, 15, 18 and 41 weeks. Another pays for six months, another full benefit for three months and half benefit for another similar period. Two pay benefits for 60 days.

Six companies provide group insurance. In five the coverage was 60,000 employees or 87 per cent of the total number employed. In one plant eligibility for the plan begins with employment, while in three a waiting period of three months was provided.

Four Plans Contributory

Four of the plans were contributory while the other two were financed entirely by the employer. Of the former, two provide for payment according to wage classification, one requires a payment of 60 cents per month from each employee, while in the fourth case a \$1.40 monthly payment covers insurance and benefit association dues.

Ten of the automotive companies had some regular educational work scheduled for their employees. Sometimes this was designed to help ambitious employees to progress while in other cases it was confined to foreman and apprentice training.

Another interesting subject covered in the survey was the administration of welfare work. In 15 of the 19 automotive companies this was handled jointly by employers and employees, while in four the employers held complete control of the activities.

The cost of welfare work varies considerably and, of course, is hard to determine accurately. Some figures were collected, however, which throw some light on the matter. The budget for the cooperative department for all plants of one company was \$2,254,880 or \$102.60 per employee. The dispensary costs in one plant of this company average \$8.35 per employee and in another and smaller plant \$6.73.

The cost of the medical department of another company amounted to \$5.70 per employee and in this plant \$16,000 was spent on a plant paper. The cost of medical departments in three other plants were \$1.92, \$3.30 and \$4.54 per employee.

Nine companies reported the general effect of welfare work to be favorable. One company reported a decrease in absenteeism. Another reported a decrease in turnover from 15 to 6 per cent per month which was largely attributed to welfare work. Still another reported labor turnover reduced from 74 per cent before the installation of an industrial relations department to 33 per cent.

Fewer Cars Actually *in* Service Than *Census* Figures Show

Errors in published registration data due to State tabulating methods which make no allowance for duplications. Constant scrapping of vehicles is also an important factor.

By K. W. Stillman

IN the Annual Statistical Issue published Feb. 19, 1928, *Automotive Industries* reported that total United States motor vehicle registrations as of Dec. 31, 1927, were 23,253,882.

On April 11, 1928, the Bureau of Public Roads issued a statement that, according to a survey made by it, the total registrations for 1927 were 23,127,315.

Other agencies at various times have also published registration figures, none of which have agreed with those cited above.

The executive who desires to use registration figures as a basis for sales planning, market analysis or other work is justified in wondering which, if any, of these various tabulations is correct and why there should be so many differences between figures covering identical conditions and obtained by agencies obviously equipped to gather accurate statistical data.

The answer to the first question can be short. None of the registration tabulations so far published by any agency has shown accurately the actual number of motor vehicles in use, or even the number actually registered during a certain period.

That registrations accumulated by the end of the year do not indicate the number of vehicles in operation at that time has become more apparent as the number of vehicles taken from service during the year has increased. Total registrations over a period indicate the number of vehicles which have been registered but do not accurately indicate the number which are in actual operation at the time the totals are taken.

Under present conditions, with the replacement market growing constantly, from 1,500,000 to 2,000,000 or more vehicles which are represented in the registration figures may be no longer in service but may have been scrapped or

otherwise removed from actual operation. Thus the total registrations are invariably greater than the actual number of vehicles in service at the time the tabulation is made.

That registration tabulations made under existing conditions do not even show accurately the number of vehicles registered during any period is due principally to the divergent methods employed by the various States in collecting and tabulating motor vehicle registration data. Granting that all cars in use are registered, which probably is not true in some rural districts, the methods in vogue in many States make it impossible to ascertain the exact number of vehicles so registered.

Just as in the case of the removal of vehicles from service, the influence of these methods all tend to increase the apparent number of motor vehicles in use; the total fictitious increment probably being well over 2,000,000 vehicles in the 1927 registration figures.

These fictitious figures collected and reported by various States arise from three sources: in the handling of transfers of motor vehicle ownership; in the replacement of license tags lost or damaged and in the handling of non-resident registrations.

Ten States, including the District of Columbia, so handle the transfer of ownership of motor vehicles that the same vehicle appears as a separate registration as many times as it may be transferred during the year. Obviously this represents a duplication which may and probably does reach to a rather large proportionate share of the total legitimate registrations.

Fortunately, in all but two States the number of transfer transactions are tabulated so that they may be deducted from the total figures reported by the various States and so eliminate duplications. In the two States where this is not be-

States Whose Registration Figures Contain Duplications

Duplicate Transfers

Alabama *	Maryland *
Arizona *	Massachusetts *
Colorado *	North Dakota *
Delaware *	Rhode Island
Dist. of Col.	Florida *

* Duplications can be eliminated.

Duplicate Replacements

Florida *	North Dakota *
Louisiana	Pennsylvania *
Maine	Utah
Maryland	West Virginia
Nevada	

* Duplications can be eliminated.

Duplicate Non-Resident Registrations

California	Kansas	Nebraska
Colorado *	Kentucky	New Jersey *
Connecticut *	Maryland	Pennsylvania
Dist. of Col.	Massachusetts	Rhode Island
Georgia	Michigan	South Carolina
Iowa *	Minnesota	Vermont

* Duplications can be eliminated.

ing done there appears to be no present method of avoiding duplication, so that the actual number of cars registered in these States can not be determined.

In nine States each license tag issued to replace one lost or damaged is counted as a new registration. Thus, if an owner lost two sets of tags during the year his one car would appear three times in the total registrations for the State—once for his original tag and twice for the replacement tags.

In only three of these nine States, apparently, are the records so kept that the actual number of replacement tags issued can be ascertained and deducted from total registrations to avoid duplicating figures.

The third source of error, that caused by the method of handling non-resident registrations, is the most prolific, there being 18 States in which resident and non-resident registrations are combined indiscriminately in the totals reported by the State officials. In so far as each State is concerned this practice has no serious disadvantages since the authorities are interested in the data primarily from a revenue standpoint. But the practice makes it impossible to determine country-wide registration totals when a very considerable number of vehicles are appearing in two or more State figures simultaneously.

In four of these States non-resident registrations are segregated so that their number can be ascertained and deducted from the reported totals. In the remaining 14 States, however, there is no present method of avoiding duplications which, under prevailing conditions of countrywide touring, may form a very important part of the State's reported total registration.

In the accompanying table are listed the States whose

published figures contain duplications, and also those States in which duplications can be avoided under present administrative methods are indicated.

In all registration figures published in *Automotive Industries* all these possible sources of error are given careful consideration. Reports of registrations, which are received directly from the State officials in charge of this work, are not accepted as received unless the records show that they are free from the errors of duplication mentioned before.

Where duplications are known to be present every effort is made to obtain accurate information as to the extent of the error and wherever it is possible to do so the figures published have been corrected to be as nearly accurate as it is possible to get them under present conditions.

To return to the questions asked early in this article, the apparent reason for differences between various registration tabulations, if the original information has been secured from official sources as that of *Automotive Industries* is, lies in the fact that the many sources of error outlined before may or may not have been considered in arriving at the totals.

Automotive Industries is in constant contact with the registration officials of the various States and immediately becomes aware of any changes in legislative or administrative procedure which effects the tabulations of motor vehicle registrations. All of these changes are considered when final computations are being made so that we believe that the figures we have published are as close to accuracy as is humanly possible under the present rather unfortunate conditions prevailing in the procedure of many States.

Oldsmobile Adds Line of De Luxe Models

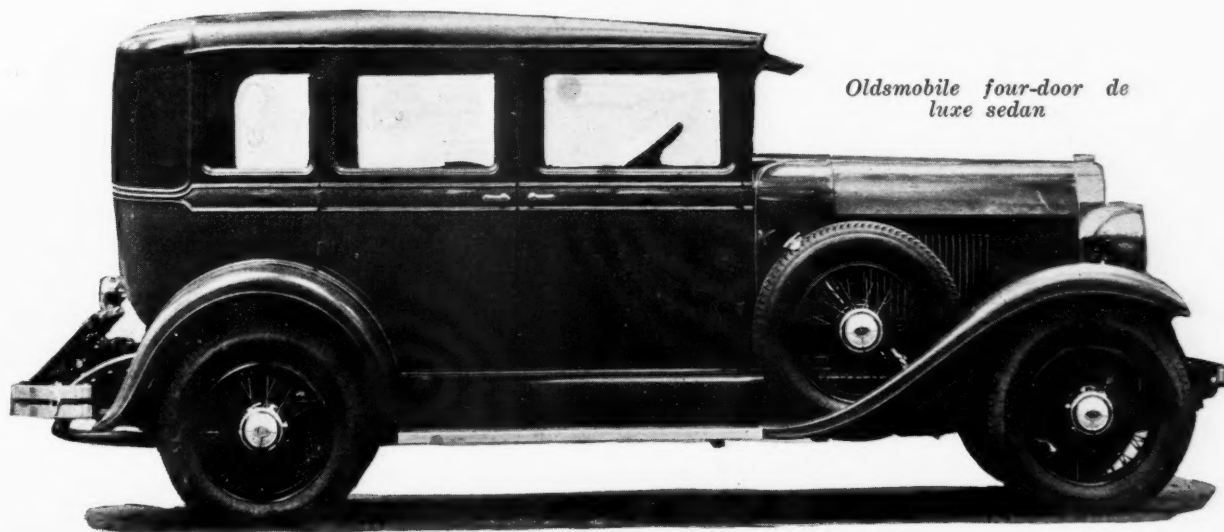
OLDSMOBILE has announced the addition of a de luxe line of body models, equipped with fender wells and six wire wheels. Improved interior finish and new color combinations are a further feature. Tires and tubes for the spare wheels are also included, the spares being held by chromium-plated bar holders which incorporate a lock.

In the landau, four-door sedan, and sport coupe such parts as fenders, step housing, hood sill, front dust shield, rear cross member skirt and headlamp tie rod are finished in colors to harmonize with body finish. With the removal of the tire carrier from the rear a

trunk rack of the folding type has been substituted.

Headlamps on the new models are chrome plated. Spring covers encase all four springs. Two-tone upholstery is used in closed models of the de luxe line. On the landau sedan a burled walnut garnish molding surrounds the instrument panel. Prices for the de luxe line are:

Roadster	\$1,145
Phaeton	1,145
4-door sedan	1,175
Sport coupe	1,145
Landau sedan	1,235



Oldsmobile four-door de
luxe sedan

Peugeot in Market *With* Two-Stroke Diesel Truck Engine

Prominent French company, operating under Junkers' license, producing two-cylinder vertical powerplant with opposed pistons. Maximum output 45 hp.

By W. F. Bradley

AFTER Mercedes-Benz and MAN in Germany and Saurer in Switzerland, the French Peugeot Company has come on the market with a Diesel truck engine. These engines are being built by the Societe Lilloise de Moteurs, which is an offshoot of the Peugeot concern, and will be supplied to manufacturers for fitting into their chassis. The engine has already been taken up by the Somua Company, and, it is stated, will be fitted to the Liberty trucks now being built in France. The army is showing interest in these engines for tanks and artillery tractors.

The Peugeot engine is built under Junkers' license. Only one model is being produced at present, this being a two-cylinder vertical two-stroke, developing 45 hp. at 1200 r.p.m. Smaller units will be produced later. The Peugeot-Junkers differs from other Diesel truck engines

at present on the market in being a two-cycle model with opposed pistons. The bore of the cylinders is 80 mm. (3.1 in.) and the combined stroke of the two pistons is 300 mm. (11.8 in.) giving a piston displacement of 183 cu. in.

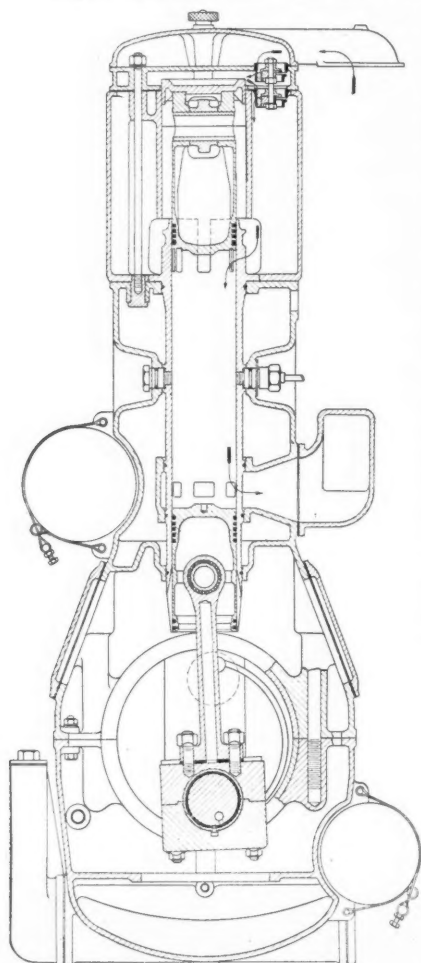
The power output is 40 hp. at 1000 r.p.m., increasing to 45 hp. at 1200 r.p.m., with a fuel consumption of 0.38 lb. p. hp.-hr. It is claimed that between 29 and 50 hp. the specific consumption remains constant, and that the load has to

be dropped below 29 hp., or carried beyond 50 hp. for the consumption to exceed 0.40 lb. p. hp.-hr.

The cylinders and crankcase constitute a single aluminum casting, with iron liners set into the cylinder barrels. By reason of the opposed piston design there is no cylinder head. The lower piston is connected to the central one of three throws on the crankshaft and the upper piston to two lateral throws. The upper piston is double-ended, the lower portion, which carries four compression rings, operating in the 80 mm. bore cylinder, and the upper end of the skirt, which has a much bigger bore, forming the piston of the air cylinder for the scavenger pump.

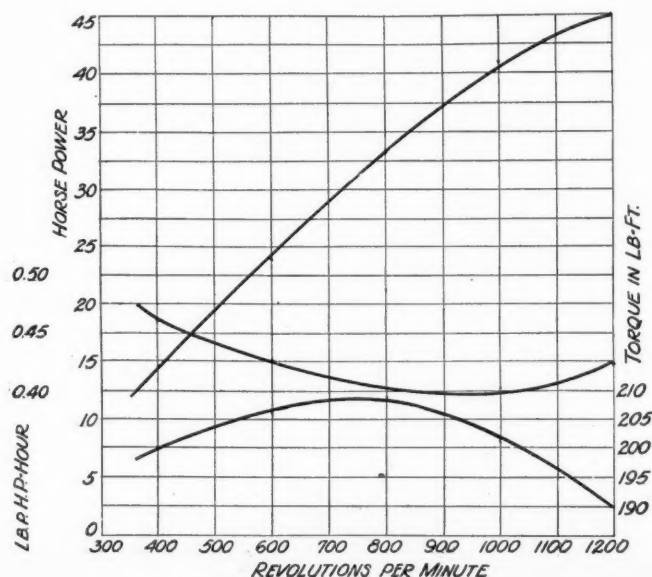
The auxiliary connecting rods, which are under tension, are attached by split bearings to the crankshaft and at the upper end have a roller bearing attachment to the cross beam carried in the piston, which latter is self-centering in the working cylinder. The lower piston is of normal construction and design, with five compression rings and two scraper rings.

The crankshaft is carried in three plain bearings lubricated under pressure. By reason of the opposed piston construction, all the main stresses are absorbed by the moving parts and are not transmitted to the housing—the crankcase and the cylinder head. This makes it possible to use higher pressures than on other engines, the volumetric compression ratio being about 19. A higher rotational speed can be maintained with a low piston speed, and by reason of the small cylinder



At left — Cross-section through Peugeot - Diesel truck engine

At right — Performance characteristics of Peugeot engine



bore the wall surface of the combustion chamber is reduced to a minimum.

The upper piston covers and uncovers the inlet ports, while the lower piston uncovers the exhaust ports. The stroke of the two pistons is not the same, thus making it possible to give a lead to the exhaust opening. Only pure air is admitted, this first driving out the remains of the exhaust gases and then being compressed. Fuel is injected by means of a constant-stroke fuel pump, starting about 17 deg. before the upper dead center. The injection point is invariable, but the quantity of fuel delivered at each stroke of the pump is varied through the operation of the throttle and the accelerator.

The fuel pump, which is Junkers' own design, is fed from a constant level float chamber and is driven direct from the front end of the crankshaft. On the left-hand side of the engine, in tandem, is the water pump and the electric generator. The usual type of electric starting motor, with Bendix gear, is fitted. The radiator fan is positively driven. The weight of the engine, without flywheel, is given as 616 lb., minus accessories, water and oil. In operation the engine is quite free from smoke or any objectionable smell, and it assures a greater degree of flexibility than a normal four-stroke, four-cylinder truck engine of equivalent power.

Course in Diesel Engine Design and Operation

THERE is said to be a shortage of competent Diesel engine operators, as well as lack of knowledge of the working principles of the Diesel engine in various lines of industry that do business with Diesel engine operators or manufacturers. Men trained in the principles and use of the Diesel engine are needed by insurance underwriters, oil companies, marine engineering departments, railroad companies, central power stations, etc.

To meet the demand for Diesel engine instruction the Polytechnic Institute of Brooklyn, N. Y., is offering an evening course on Diesel engines. The course was first given in 1923 and some 400 men have taken it so far. These men now occupy such positions as marine superintendents and engine operators, steam engine operators, oil chemists, oil salesmen, railway engineers, tugboat engineers, insurance men, etc.

The Polytechnic Diesel engine course is not part of the regular undergraduate work of the institute, but is designed solely for the man interested in oil engines regardless of his previous education. To meet the needs of those who wish to train themselves for operating, building, selling or designing oil engines, a lecture course is supplemented by class room exercises and laboratory periods. Several varieties of oil engine are available in the laboratory for demonstration and testing.

The economics of oil engine power are treated in the course, and special emphasis is laid on operation and maintenance. Since it is felt that a knowledge of how and why a given type of engine came into being is indispensable for a well-grounded operating knowledge, these matters are treated in detail. The scientific and mathematical aspects of oil engine construction are developed for those students who wish to take up manufacturing and designing work.

The subjects treated are combustion; solid and air injection; two-stroke and four-stroke cycles; fuel

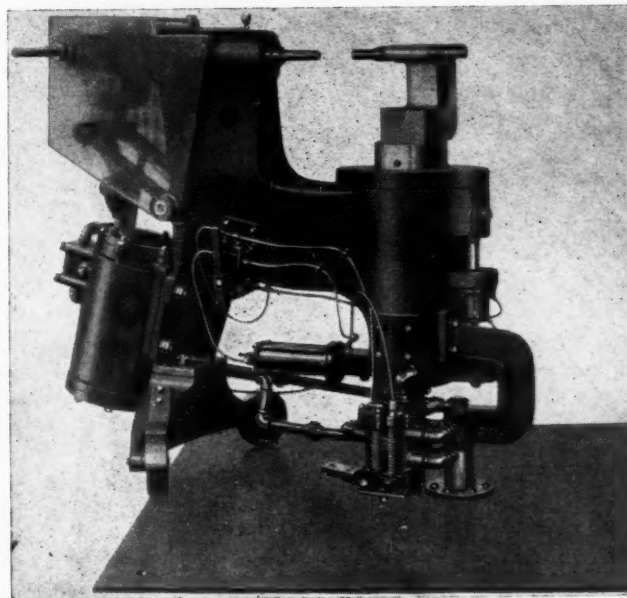
pumps; bedplates and framing; cylinders, cylinder heads, pistons, bearings, valves, and valve gears; starting and reversing systems; lubricating and cooling systems; selection of fuel and lubricating oils; oil engine locomotives; installation, alignment, fitting, overhauling and adjusting; cost data.

Supervision of the conduct of the course is in the hands of Prof. E. F. Church, Jr., head of the Department of Mechanical Engineering. The lectures are prepared and delivered by Edgar J. Kates, consulting engineer and chairman of the Oil and Gas Power Division, American Society of Mechanical Engineers. Prof. W. J. Moore of the Polytechnic Institute is in charge of the laboratory exercises and demonstrations. Assistant Prof. Frank D. Carvin conducts the classroom discussions and test.

Hanna Riveting Machine

HANNA ENGINEERING WORKS, Chicago, is marketing a new riveting machine which is particularly suited to driving the web rivets in the side bars of a chassis frame.

The stake which supports the stationary die and which enters the interior of the chassis frame rotates about its vertical axis and can be locked in two positions 180 deg. apart. The upper section of the stake is



Hanna frame riveter

goose-necked and the rotation throws this offset either to the left or the right. Thus the stationary die may be centered upon a rivet joining a channel-shaped cross-member to the side bar channel web whether the flange legs at the top and bottom of the cross-member extend toward the front or the rear of the frame.

The stake has double die mountings on one axis so that one is in position to oppose the live die at either indexing point. The machine is mounted on a radially rolling base which permits it being swung from one side of a suspended frame to the other.

Machines exerting pressure of 15, 20 and 30 tons are available, all operating at 100 lb. air pressure. The one shown is the largest size and will drive hot rivets up to $\frac{3}{4}$ in. diameter and $\frac{7}{16}$ in. cold.

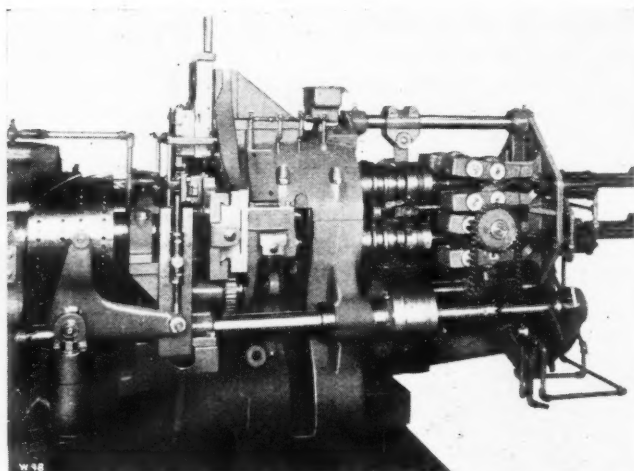
NEW DEVELOPMENTS—Automotive

Rapid Roll Feed Mechanism

RAPID production of simple parts, such as pipe coupling blanks from hot rolled stock, 35 ft. rods, is facilitated by a new type of roll feed mechanism originated by the Cleveland Automatic Machine Co., Cleveland, Ohio.

In the accompanying illustrations the roll feed mechanism is applied to specially adapted Cleveland Automatic 2 in. and 1½ in. Model M, four-spindle bar machines, designed for four-position work, so that four blanks are produced during each feed period. The installation also includes a support for the rods, consisting of four housings held by adjustable standards.

The feed rolls are V-shaped and mounted on toggle arms. They are continuously driven by a system of



Detail view of the roll feed mechanism

gears actuated by chain and sprocket, which is geared to the lower camshaft in the rear. Cams on the same shaft control the action of air cylinders which govern the roll mechanism and also the gaging and chucking operations.

Opening of valves communicating with four air cylinders drives the four pistons which impart a jaw action to the toggle arms carrying the rolls. As each pair closes upon a bar independently of the others, any variation in the size of the bars does not affect the feed

of another bar. Feeding forward, the bars are gaged by four gage stops mounted on a center drive shaft sleeve. After gaging, the stops are withdrawn slightly for chip clearance. At the same time a sliding shoe, actuated by a drum and cam on the lower shaft, operates four thimbles which close the chucks—chucking the stock on live spindles. Compression springs back of the finger block compensate for any irregularity in the stock. The feed rolls meantime release the stock by a reversal of the air current which reverses the jaw action of the toggle arms.

Each gage stop has an opening of the same size as the drill. When the gage stops recede, the turret bearing the four drills advances. The turret is non-indexing. Drilling is accomplished through the openings in the gage stops, so that the latter act as tool guides and strippers as well as gage stops. Simultaneously, tools mounted on the cross slides form the corner of the o.d. and cut off the blanks. Stenciling is done by four pivoted sectors which advance with the slides and roll the manufacturer's mark into the blanks with a single pass of the stock, being then held out of position. Stripping four blanks and gaging stock for the next four is accomplished by a single forward motion of the gage stop.

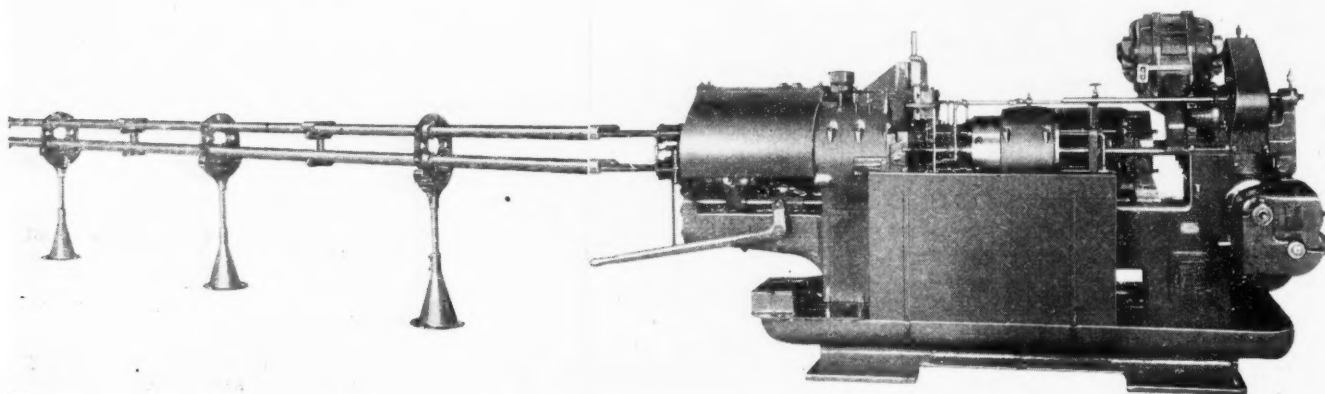
Subsequent beveling of the mouth of the hole is done on a specially designed Cleveland Automatic Model J double end machine with magazine feed, after which the pieces are tapped.

This mechanism is claimed to mark a forward step in the utilization of inexpensive stock materials for rapid production of simple parts with a minimum of attendance labor. An installation similar to the above, but without the roll feed, has been designed for the manufacture of nuts.

Wheel Balancing Machine

A NEW Micro-Poise balancing machine for automobile road wheel tires and rims has been developed by Commerce Pattern Foundry & Machine Co., Detroit, on which it is said to be possible to balance accurately 60 wheels per hour.

In operation the work is placed on the machine, the operating lever is moved and a universal level shows the angle of unbalance. Weights are placed on the

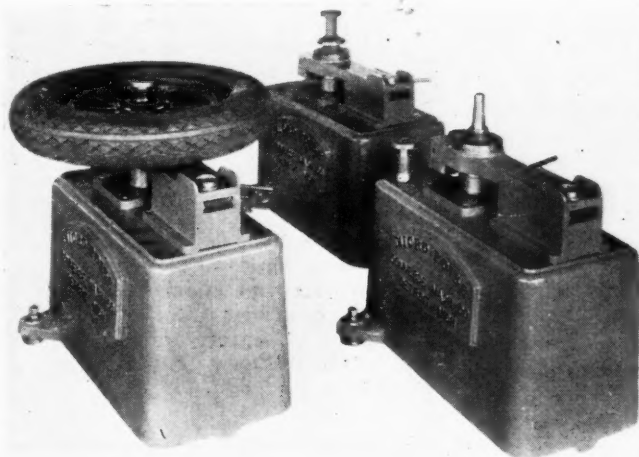


Cleveland automatic with roll feed for feeding bar stock 35 ft. long

Parts, Accessories and Production Tools

rim to compensate for the moment of unbalance and the size and position of the weights marked on the tire, after which the wheel is removed and the weight attached.

The machine is adapted for placing weights on the



Micro-Poise wheel balancing machine

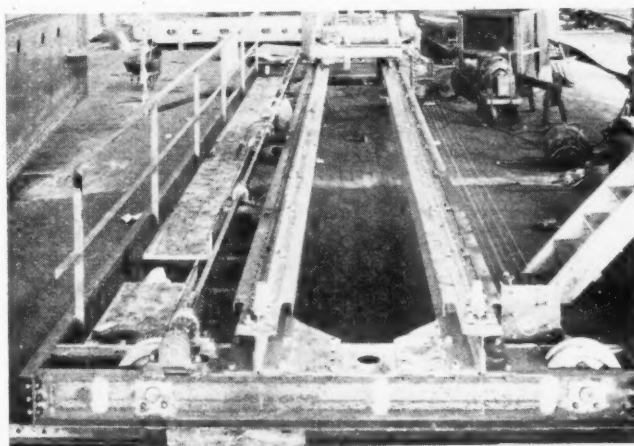
rim to obtain balanced conditions with regard to the fact that there are a limited number of points for attaching the weights to the wheels.

Arc Welded Crane

THE Cleveland Crane & Engineering Co., Wickliffe, Ohio, has developed a new design of overhead traveling crane in which the bridge girders, end trucks and trolley are constructed by arc welding.

Each girder is reinforced by angles arc welded to the standard I-beam sections. The girders are attached to the end trucks by notched or shoulder construction to prevent weaving. They are shipped disassembled and the field connection is made by bolts.

The end trucks are built of two standard channel sections joined by arc welding. Roller bearings are used to give rapid acceleration and low power consumption.

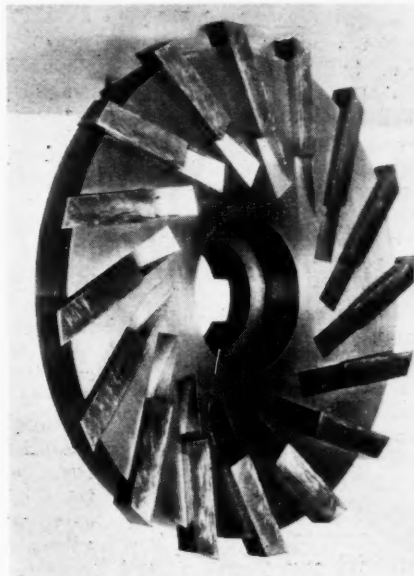


A 5-ton, 38 ft., 9 1/4 in. span crane of the arc welded, I-beam girder type developed by Cleveland Crane & Engineering Co.

Trolley frames are made of a standard channel with arc welded braces under each bearing point. Gear guards are arc welded as is also the hand rail on the foot bridge and the bearing supports for the bridge driveshafts.

Tindel Rotary Cutters

TINDEL & PHILLIPS, Philadelphia, Pa., are manufacturing a new milling tool for which they claim several advantages over similar tools now in use. The blades are set in the cutters in lathe-tool style and it is claimed that they are immovable while cutting, yet



Tindel Rotary Cutter

are adjustable for wear. The cutters are made for surfacers, slotters, saws and channelers, and are said to be particularly efficient for machining large flat surfaces.

Durant Productimeter

DURANT MANUFACTURING CO., Milwaukee, has brought out a new model Productimeter designed particularly for measuring output from small drill presses, light-duty conveyors and similar equipment.

This new model has special bronze bushings which give long service, require little oil and can be easily replaced when worn out. A new drive sleeve is designed to prevent racing of the counter when operated at high speed. Large drive and pinion shafts are employed with a drop-forged operating lever designed so it can be set at any angle which is desired.

The new counter can be furnished in right or left-hand drive and right or left-hand reset, and also can be furnished with either rotary or reciprocating action.



New Durant Productimeter

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania August 4, 1928

Continued High Operations Seen Throughout Summer

PHILADELPHIA, August 4—The high retail sales movement of automobiles in July gives promise not only of being sustained in August but of being increased with the introduction of new models in several popular priced lines. Reports from leading centers show a rate of retail sales only slightly below the June record and considerably in excess of the usual seasonal marks.

Factory operations during July have been slowed down by inventory periods and some closings will take place in August but in the main the factory pace has been active enough to require practically full employment and there is no indication of marked reduction. Factories with current new models are at capacity or striving to reach this level because of pressure from retail sources. Several factories not introducing new models report sales in advance of production.

With production in the first half of the year within a half-month's output of the record production of the first half of 1926, the industry is looking for a rate of output in the last half which will bring the total for the year to a record level. This will mean an output only slightly less than in the

(Continued on page 176)

Peerless to Show New Cars

CLEVELAND, July 30—Peerless Motor Car Corp. will announce new 1929 models in the next week or ten days, according to an official of the company. The new model is a six-cylinder car, and has been undergoing experiments for some months. The Cleveland plant is already in production on the new model, and demonstrators are now in shipment, and will be in the hands of dealers in a few days.

Plymouth Prices Increased

DETROIT, Aug. 1—Chrysler Corp. has increased prices on five of its Plymouth models from \$5 to \$15, effective today, the advance being due to increased cost of labor. The new prices are: Coupe, \$685; roadster, \$675; two-door sedan, \$700; de luxe coupe, \$735, and four-door sedan, \$735. The prices of the touring car and chassis are unchanged at \$695 and \$490.

Czechs Take More Cars

WASHINGTON, Aug. 2—Czechoslovakia will import approximately 1300 American automobiles in 1928 instead of 800 as formerly estimated, according to dispatches received from Prague by the Department of Commerce.

High Summer Rate Shown by Factories

DETROIT, Aug. 2—Continuance of production at levels considerably in excess of usual summer levels is indicated by reports from leading companies for July.

Buick Motor Co., following introduction of its new line late in July, has scheduled 32,000 cars in August, according to C. W. Churchill, general sales manager.

Hudson Motor Car Co. shipped 25,206 cars in July, bringing the total for the year to 208,271.

Hupp Motor Car Corp. shipped 5010 cars in July compared with 2560 in July last year. Seven months' shipments total 43,434 as against 24,877 in the same period last year. The company enters August with approximately 3000 unfilled orders.

Graham-Paige Motors Corp. built approximately 9000 cars in July and has scheduled 10,000 for August, according to R. C. Graham, vice-president in charge of sales. The company is behind on orders, he said.

Reo Motor Car Co. shipped 4814 cars and trucks in July as against 3713 in July last year. Shipments in the first seven months total 30,845 as against 29,374 in the same period last year. The August schedule is for 4500.

Ford Motor Co. is now building about 3800 cars daily.

Studebaker Offers Delivery Car

SOUTH BEND, Aug. 1—A longer chassis of 109 in., a deeper and more graceful radiator, and a body of long, graceful contour are the features of the new ½-ton delivery car announced by the Studebaker Corp. of America. Other features are quick acceleration, four-wheel brakes, short turning radius, low gasoline and oil consumption. This model is a refinement of the Studebaker ½-ton delivery car which was announced the first part of the year.

The new model is being offered in two body styles; a panel delivery listing at \$875 and a screen type delivery at \$860.

Armored Cars Given Place in Cavalry

WASHINGTON, Aug. 2—The U. S. cavalry, last great stronghold of the horse, is being invaded by the automobile.

The War Department announces that the recently organized first armored car troop, now on duty at Fort Leonard Wood, will ultimately be assigned to the first cavalry division at Ft. Bliss, Texas, and hereafter a troop of 12 armored cars will be sought by the army as standard piece-time complement for each division of cavalry, with this number trebled during war times.

Sloan Restates Freedom of G.M. from Politics

FLINT, Aug. 2—Alfred P. Sloan, Jr., president of General Motors Corp., restated the corporation's independence in politics in an address on the importance of good will at the silver anniversary dinner of Buick Motor Co. He cited the value of General Motors as measured in the market is approximately \$3,500,000,000, whereas the value of the corporation's assets is \$850,000,000—the \$2,650,000,000 difference being the good will valuation established by the public.

Other speakers at the dinner were W. H. McKeighan, mayor of Flint; Hon. F. W. Green, governor of Michigan; C. F. Kettering and E. T. Strong of General Motors, and H. G. Gault and C. V. Courter, Flint officials.

Wright Triples Earnings

NEW YORK, Aug. 1—Wright Aeronautical Corp. reports net income for the first half of 1928 as \$1,092,875, equivalent to \$3.64 a share and comparing with \$355,741 or \$1.42 a share for the same period in 1927. Profit for the second quarter is \$621,978 or \$2.07 a share and compares with \$222,071 or 89 cents a share in the same quarter last year.

P. V. Vernon

COVENTRY, ENGLAND, July 23 (by mail)—P. V. Vernon, director and chief designer of Alfred Herbert, Ltd., this city, died July 22 after a brief illness at his home here. He was well known throughout the engineering world and had been associated with Alfred Herbert, Ltd., for 31 years.

Merger Committee Meeting Postponed

Illness of McKenna Delays
A.E.A. and M. & A.M.A.
Plans for Combine

NEW YORK, Aug. 4—The meeting of the joint by-laws committee of the Motor & Accessory Manufacturers Association and the Automotive Equipment Association scheduled to be held in Chicago, Aug. 6, is expected to be postponed for a few days owing to the illness of R. T. McKenna, general counsel of the M. & A.M.A. who, with M. L. Heminway, M. & A.M.A. general manager, was to bring into final form for presentation to the committee the revised by-laws discussed at the July meeting of the two groups.

"Presentation of the final draft of the by-laws to the joint committee, and official approval of this final draft by the M. & A.M.A. board of membership is necessary to a final completion of the merger negotiations," J. M. McComb, president of the M. & A.M.A., said here today.

Machine Tool Builders

Fix Date for 1929 Show

CLEVELAND, Aug. 2—The date for the second National Machine Tool Builders' Exposition has been set for Sept. 30 to Oct. 4, 1929, and a lease has been signed for a part of the Public Auditorium here. The exposition will be under the sole sponsorship of the National Machine Tool Builders Association and attendance will be restricted to those connected with the manufacture or use of machine tools.

The order of preference for admission of exhibits has been established so that first selection of space will go to members of the association; second selection to non-member American manufacturers; third, trade press and direct accessories used exclusively on machine tools, and fourth, components and supplies not used exclusively in connection with machine tools.

The exposition committee is headed by J. Wallace Carrel, the Lodge & Shipley Machine Tool Co., Cincinnati. Exposition offices will be maintained in New York.

Oakland Adds Presses

PONTIAC, July 30—Oakland Motor Car Co. is adding 13 toggle presses to the sheet metal plant. Two of these are said to be the largest of their kind in the world, exerting a pressure of 1000 lb. at a single stamping.

Chevrolet Truck Now \$520

DETROIT, Aug. 1—Chevrolet Motor Co. is now building its Utility truck with four-wheel brakes and a four-speed transmission, the gear-set formerly being offered as optional equipment at \$65 extra. The remodeled trucks lists at \$520, an increase of \$25.

A channel type front bumper attached to the front spring horns is now standard equipment.

In the new braking system, internal front wheel brakes have been added, the external rear wheel brakes continuing unchanged. Inside diameter of the front brake is 10½ in. with sufficient width to receive 1½ in. lining. The total braking area is 317 sq. in. The independently operated internal hand brake on the rear wheels is retained.

Aero Chamber Votes Reorganization Plan

The Aeronautical Chamber of Commerce, New York, has announced plans of a reorganization under which the chamber will maintain offices in various parts of the country with a vice-president in charge of each office. Major A. L. Gardner was named president and other officers were elected as follows:

Vice-President, Eastern Division—F. B. Rentschler, president Pratt & Whitney Aircraft Co.

Vice-President, North Central Division—C. B. Fritsche, vice-president and general manager Aircraft Development Corp., Detroit.

Vice-President, Great Lakes Division—Colonel Paul Henderson, vice-president and general manager National Air Transport, Inc., Chicago.

Vice-President, South Central Division—Walter Beech, president Travel Air Mfg. Co., Wichita, Kan.

Vice-President, Northwest Division—P. G. Johnson, president Boeing Airplane Co., Seattle.

Vice-President of the Commercial Airplane Manufacturers Section—J. D. Alexander, president of the Alexander Aircraft Co., Colorado Springs, Colo.

Vice-President and General Manager—S. S. Bradley.

Secretary—L. K. Bell.

Treasurer—Owen A. Shannon.

The Board of Governors—C. J. Bruckner, president Advance Aircraft Co., Troy, Ohio; C. H. Colvin, president Pioneer Instrument Co., New York; S. M. Fairchild, president Fairchild Aviation Corp., New York; T. F. Hamilton, president Hamilton Metalplane Co., Milwaukee; J. D. Hunsaker, president American Telephone & Telegraph Co., New York; C. L. Lawrance, president Wright Aeronautical Corp., Paterson, N. J.; C. T. Ludington, president J. B. T. Corp., Philadelphia; General John F. O'Ryan, president Colonial Air Transport, Inc., New York; H. F. Pitcairn, president Pitcairn Aviation, Inc., Philadelphia; F. H. Russell, vice-president Curtiss Aeroplane and Motor Co., New York; J. M. Russell, president J. M. Russell Parachute Co., San Diego, Cal.; Walter Varney, president Varney Aeroplanes, Inc., San Francisco.

Fohey Gets Chrysler Post

DETROIT, Aug. 2—R. P. Fohey, secretary-treasurer of Dodge Brothers, Inc., has been elected assistant comptroller of the Chrysler Corp. He will be in charge of all Chrysler account activities with reference to the operation of the former Dodge Brothers plants, reporting to L. A. Moehring, comptroller of the Chrysler Corp.

Business in Brief

Written by the Guaranty Trust
Co., New York, exclusively for
AUTOMOTIVE INDUSTRIES.

NEW YORK, Aug. 2—Although the midsummer lull is here, retail trade is slightly more active than it was at this time last year. The hot weather throughout the country continues to stimulate seasonal consumption.

Wholesale trade, as reported by the Federal Reserve Board, declined in June, as compared with May, in practically all lines excepting meats and furniture. For the first six months of this year, wholesale business was 1.5 per cent smaller than for the same period last year. Inventories carried by reporting wholesale firms and measured in dollar values were found to be about the same as were reported by these firms in May and June, 1927.

FREIGHT CAR LOADINGS

The movement of railway freight during the week ended July 14 was slightly larger than a year ago. Car loadings numbered 1,024,534, which is 173,929 more than in the preceding week and 7140 more than in the corresponding period last year.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended July 25 were 8 per cent higher than in the similar period in 1927.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices remained unchanged last week at 99.9 per cent of the 1926 average, the highest point reached so far this year.

STOCK MARKET

Although the volume of trading was still moderate, the stock market last week was slightly more active than in the preceding week. The general trend was irregularly upward with copper, steel and independent motor stocks exhibiting the greatest strength. Little of this can be attributed to the money market, for conditions here remained about the same as in the previous week. The call money rate prevailed at 5½ per cent, but was raised to 6 per cent on Monday of this week, by reason of the month-end demand for money.

Brokers' loans decreased \$10,000,000 in the week ended July 25. There was a decrease of \$50,000,000 in loans for account of out-of-town banks and an increase of \$37,000,000 in loans from private sources.

FEDERAL RESERVE REPORT

The combined Federal Reserve report of July 25 shows an increase of holdings of discounted bills of \$13,400,000, an increase of \$2,300,000 in cash reserves, and a decrease of \$12,000,000 in holdings of bills bought in the open market. The reserve ratio was 69.9 per cent, as compared with 69.5 per cent a week earlier.

G.M. Net For Half Gains \$32,017,767

Total of \$161,267,974 Com-
pares With \$129,250,207—
Cash Totals \$264,383,668

DETROIT, July 27—General Motors Corp. for the first half of 1928 had net earnings of \$161,267,974 compared with \$129,250,207 for the first half of 1927, a gain of \$32,017,767. After dividends on preferred and debenture stock there remains a balance of \$156,565,974, equal to \$9 a share on the common stock, compared with \$124,841,987, or \$7.17 a share, in the first half of 1927, on a comparable share basis.

On June 30, cash, United States Government and other marketable securities amounted to \$264,383,668, a record for cash and cash items in the history of the corporation. Net working capital was \$320,346,653, an increase of \$47,422,377 since Dec. 31, 1927, after deduction of the extra dividend of \$34,800,000 paid July 3, 1928.

Earnings for the second quarter were \$91,799,398 against \$76,698,799 in the second quarter of last year, a gain of \$15,100,599. The figures established new earning records both for the half year and the second quarter, it was stated by Alfred P. Sloan, Jr., president.

Of production, Mr. Sloan said: "For the six months ended June 30, retail sales by General Motors dealers to users were 1,062,733 cars, compared with 840,481 cars in the corresponding period of 1927. General Motors sales to dealers for the six months totaled 1,083,316 cars, compared with 883,477 cars in the corresponding period of 1927. Current conditions are satisfactory."

Motor Wheel Earnings \$1,331,074 in First Half

DETROIT, July 28—Net earnings of Motor Wheel Corp. for the second quarter total \$769,929 as against \$531,544 in the second quarter last year.

Gross income for the first six months totaled \$1,854,486, of which more than \$1,000,000 was received during the second quarter, against \$800,000 for the first three months. Total net income after deductions is \$1,331,074 for the first six months as against \$1,036,947.

Marmon Orders 30 Days Ahead

INDIANAPOLIS, July 30—Orders received by Marmon Motor Car Co. are more than 30 days ahead of its manufacturing schedule, G. M. Williams, president, reports. Production of 500 cars weekly until Sept. 1 is insured with indication of an increased schedule in view of unusually low dealer stocks in all parts of the country. Retail sales are holding even with record business in June and sales reported up to July 23 are 60 per cent ahead of the entire month of July last year.

Ford Ship Leaves for Brazilian Tract

DETROIT, July 28—The motor ship, Lake Ormoc, which will carry an expedition from the Ford Motor Co. to Brazil, where Ford has 5,000,000 acres of Brazilian jungle land for development as a rubber plantation, sailed from Detroit this week. The ship will proceed to New York, where it will be joined by the tow-ship, Lake Farge, and will then proceed to Santarem, Brazil, where it is expected the expedition will remain for two years.

The ship's equipment includes a modern hospital, chemistry and experimental laboratory, machine shop and refrigeration plant.

Caterpillar Tractor Co. Plans Further Expansion

SAN FRANCISCO, Aug. 1—The Caterpillar Tractor Co., which has become a \$30,000,000 industrial, announces through its president, R. C. Force, that further expansions of buildings, machinery and production are planned immediately, in spite of the extensive additions to the plant at San Leandro, Cal., made last year. The balance sheet of this company, which is combined with the Western Harvester Co. to June 30, 1928, shows total assets of \$30,269,353, as compared with \$25,133,913 at the end of 1927. Directors recently declared an extra dividend of 20 cents per share, on the showing of a net earning of \$1.73 per share for the second three months of 1928, a 44.1 per cent increase over the same period of 1927. This year's net earnings will be \$6.07 per share, as compared with \$4.25 for 1927, according to President Force, whose report was made public at the end of July.

White Earns \$1,161,830

NEW YORK, July 30—White Motor Co. reports consolidated net income after all charges for the six months ended June 30, as \$1,161,830. This is equivalent to \$1.45 a share on outstanding stock and compares with \$870,369 or \$1.08 a share for the first half of 1927. Quarterly dividend of 25 cents a share on common and \$1.75 a share on second preferred has been declared, payable Sept. 25 and 29 respectively to stockholders of record Sept. 15.

To Erect \$90,000 Unit

MILWAUKEE, July 28—The Geuder, Paeschke & Frey Co., manufacturing automobile mufflers and other units, and tin, sheet iron and enameled ware, has let the contract to the Austin Co., Cleveland, for erecting a one-story manufacturing and storage building, 190 x 405 ft., as a new unit of its group. The building will cost \$90,000.

Studebaker Earnings \$8,583,296 in Half

High Cost of Recent New
Models Brings Lower Net
in Second Quarter

NEW YORK, July 30—Studebaker Corp. of America reports net earnings for the first half of the current year as \$8,583,296, slightly in excess of \$8,472,383 in the corresponding period of 1927, being equivalent to \$4.44 a share on common stock as compared with \$4.38 for 1927. Net profits for the second quarter were \$4,603,423, or \$2.39 a share as compared with \$5,069,446, or \$2.63 for the corresponding quarter last year. Reduced profits are attributed to the initial high costs of the new models introduced in June, together with reserves for extra discounts for dealers.

In commenting on the new models, A. R. Erskine, president, says:

"The new models have created a nation-wide interest. June sales showed an increase of 65 per cent and July figures are running about 50 per cent ahead of last year. Dealers' deliveries to the public are now exceeding our production by 35 per cent and their stocks are low. A fine third quarter is therefore in prospect for the corporation."

During the second quarter, 40,594 cars were sold as compared with 32,665 in the same quarter of 1927, an increase of 24 per cent. Net working capital as of June 30, was \$40,400,000 and compares with \$36,700,000 on the first of the year.

Spicer Net \$854,955

NEW YORK, July 30—Spicer Mfg. Corp. reports net profit for the first six months of 1928 as \$854,955 before taxes. This is equivalent to \$2.53 a share on common stock after payment of preferred dividends and compares with \$713,631 or \$2.09 for the same portion of 1927. Profit for the second quarter was \$434,687 or \$1.29 a share and compares with \$372,324 or \$1.09 for the corresponding quarter of 1927.

Moon Adds Oilometer

ST. LOUIS, July 30—Improvement of its 8-80 and 6-72 models for 1929 by the addition of a central chassis lubricating system is announced by Moon Motor Car Co. The system used is the "Oilometer" automatic lubricator manufactured by the Stanley Automotive Products, Inc., New York.

Rockford Adds to Plant

ROCKFORD, July 28—The Rockford Metal Specialty Co., manufacturing automobile hardware, is erecting a two-story plant addition, 50 x 150 ft. The investment in building and machinery will approximate \$100,000. A. A. Anderson is president.

High Seasonal Sales Are Seen Continuing

Inability of Ford to Increase Production Held Aid- ing Other Lines

DETROIT, July 31—The automotive industry enters August with every indication that the record seasonal business which has characterized the earlier summer months will continue. The fact that business is not reacting unfavorably as during previous national elections makes manufacturers confident that present good sales conditions will continue to prevail.

Inability of Ford Motor Co. to step its production up to schedules which had previously been anticipated, is perhaps the biggest puzzle in the industry. Reports indicate that the output hovers somewhere above 3000 cars a day, while the company had expected weeks ago to attain a rate of at least 5000 daily. The trouble is purely a production problem which the Ford company has been unable to overcome. Ford dealers everywhere have many orders and at the present rate of output indications are that thousands of buyers will have to wait months before delivery.

The Ford situation has reflected favorably for other makers of reasonably priced automobiles. Persons who have tired of waiting for delivery have either forfeited their deposits or obtained a return and have turned to other makes in the lower priced brackets. This has resulted in a record business for all in this particular field.

Demand for cars in the lower priced group continues at an exceedingly high rate and indications are that manufacturers in this classification should continue to do an unusual business throughout the balance of the summer and in the early fall.

New Models Bring Buying

New models by a majority of manufacturers in the \$1,000 to \$2,000 field have created a new buying wave in this classification with a result that manufacturers should continue to enjoy a record business for some months to come. Even manufacturers in the higher priced fields are making changes which should improve their selling situation materially.

Reports received by factory sales officials indicate that the automobile buying has not been confined alone to new car sales. There has been an excellent market for used cars and dealers who have been smart enough to carefully control and recondition their stocks have, in the whole, been able to keep their used car stocks within reason, and this is a particularly healthy condition, especially in view of the heavy wave of new car selling which usually leaves dealers holding the bag with more used cars than they can move.

Perhaps one of the best indications of

55 Nations Invited to Aviation Meeting

WASHINGTON, July 28—Fifty-five nations have been invited to the international conference on civil aeronautics in this city Dec. 12 to 14, it was announced at the State Department. The conference will be held in connection with the twenty-fifth anniversary of the first airplane flight by Orville and Wilbur Wright at Kitty Hawk, N. C. The foreign nations were also advised that the aeronautical industry of the United States also plans to hold an international aeronautical exhibition in Chicago the week preceding the Washington conference.

the widespread prosperity as reflected in the automotive industry are reports from 20 of the country's large cities. For the first six months only four of them registered a decrease and the loss ranged from 2 to 6 per cent. Gains of the other 16, however, ranged as high as 25 per cent. A further study of these figures revealed that every city registered sales increases for June compared with the corresponding month last year, with Detroit leading the country with a gain of 38 per cent. The smallest increase was in Syracuse, which showed 2 per cent.

Foreign Sales in May Set Record of 86,000

NEW YORK, July 30—New peaks in sales of automobiles of American design abroad were recorded in May, when such sales reached a figure of 86,000, according to the National Automobile Chamber of Commerce. This figure, it is pointed out, would represent foreign sales of over 1,000,000 a year. While this is not regarded as a likely occurrence this year, the chamber anticipates that it will not be long before average monthly sales of American designed cars abroad will be close to the 86,000 figure.

This sale of American cars abroad has created 12,000 jobs for natives in the countries in which the cars are sold, the chamber estimates. This figure is based on an analysis in this country which reveals that every seven cars in use give employment to one man, either chauffeur, garage man, repair man, road builder, or salesman.

MacWhyte Adds to Plant

KENOSHA, July 28—The MacWhyte Co., manufacturer of wire rope and cable, is making an addition to its plant to provide adequate capacity to handle the increasing call for its products from the automotive and aircraft industries. George S. Whyte is president.

St. Louis Organizes Car Salvage Plant

Dealer Subsidiary Plans Scrap- ping Obsolete Models Ac- cepted in Trades

ST. LOUIS, Aug. 1—The final organization of the Auto Dealers' Salvage Co. of St. Louis has been completed and the yard, a former lumber yard at 6600 Easton Avenue, will be in operation Aug. 15. Officers of the company are George Weber, Weber Implement & Auto Co., president; Phil H. Brockman, De Luxe Auto Co., vice-president; Robert E. Lee, secretary of the Auto Dealers Association, secretary-treasurer, and R. C. Frampton, Hudson-Frampton Co., and F. R. Tate, Dodge distributor, directors. The company is a closed corporation within the association, with the association holding the control.

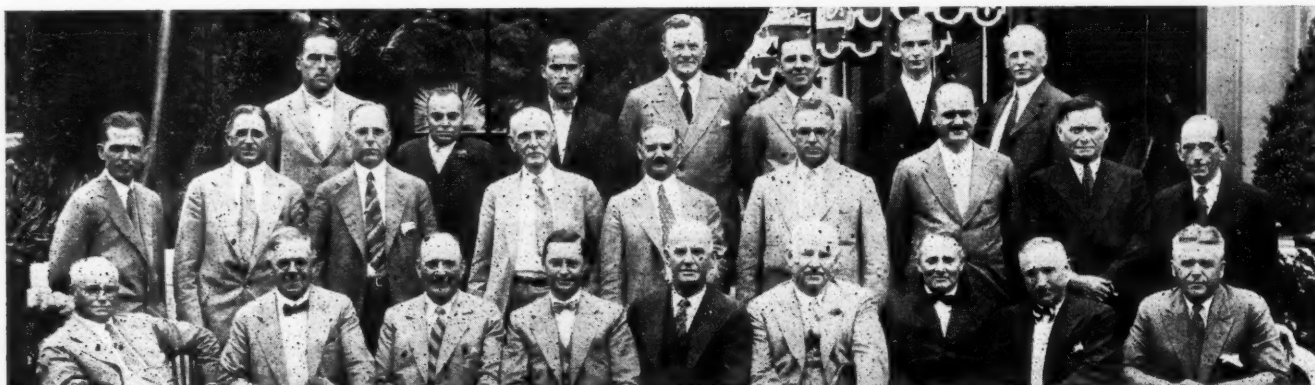
It was decided to organize the salvage company to take obsolete "trade-ins" off the hands of local dealers when it was learned that approximately 4000 old cars were being sold for junk in St. Louis each year. It will be a rule of the company that any machine entering the confines of the yard will cease to exist as an entity. Spare parts will be salvaged in some cases and a spare parts store will be operated in connection with the yard. Practically 90 per cent of the business of the yard will be in junk, however.

The salvage yard has been leased for a period of five years. It was selected from a number of other sites because of its accessibility to railroad facilities. J. W. Wright, an expert metallurgist, has been retained to direct the salvage operations.

California Ruling Holds Planes Motor Vehicles

SAN FRANCISCO, July 30—Any vehicle propelled by a motor is a "motor vehicle," according to U. S. Webb, attorney general of California, in a ruling just handed down placing all airplanes operating in this state under the control of the motor vehicle department of the state government. Harry L. Huston, attorney for the department, is working on a system of procedure for the imposition and collection of taxes on aircraft, and until this tax is levied and collected, there will be no funds with which to undertake supervision of planes in intrastate flight, according to Frank G. Snook, chief of the state motor vehicle department. Under the law, the state requires that every plane—except those owned by the United States government—be registered with the state and that an annual license fee of \$5 be paid. A marker at least 3 ft. high, indicating ownership, must be placed on the under side of the plane. Pilots under 19 years of age are barred by the act, and no acrobatics can be performed under an altitude of 1500 ft.

Men of the Industry and What They Are Doing



N.A.C.C. Directors and Guests at the Home of A. R. Erskine

National Automobile Chamber of Commerce directors were guests at the home of A. R. Erskine when the board met at South Bend. The Studebaker Corp. of America was in charge of arrangements. In the picture are, left to right, first row: C. D. Hastings, Hupp Motor Car Corp.; R. E. Olds, Reo Motor Car Co.; C. W. Nash, Nash Motors Co.; Roy D. Chapin, Hudson Motor Car Co.; Alvan Macauley, Packard Motor Car Co.; A. R. Erskine, Studebaker, Corp.; Walter C. White, White Motor Co.; I. J. Reuter, Olds Motor Works; A. R. Glancy, Oakland Motor Car Co. Second row: E. L. Cord, Auburn; W. P. Cooke, director Pierce-Arrow; M. E. Forbes, Pierce-Arrow; Thomas Henderson, Oberlin, Ohio; Alfred Reeves, N. A. C. C.; F. B. Sears, Elcar; H. S. Vance, Studebaker; E. N. Hurley, Studebaker director; G. H. Kelley, White Motor Co. Third row: Edward Macauley; G. F. Rand, Pierce-Arrow director; Alvan Macauley, Jr.; M. H. Pettit, Nash; Paul G. Hoffman, Studebaker; A. R. Erskine, Jr.; J. S. Marvin, N. A. C. C.

Nash to Hunt in Texas

Tom Cooper, Oklahoma Nash distributor; Otis M. Smith, general manager of the Oklahoma City branch; Moss Patterson and J. D. Jones of McAlester, Walter C. Irvin of Amarillo, Percy Garrett of Fort Worth, C. W. Nash, president of the Nash Motors Co., and Haskell Bliss, general sales manager of the company, are to comprise a hunting and fishing party in southwestern Texas under Cooper's direction and as his guests.

Tipper Goes Abroad

Harry Tipper, general sales manager of the General Motors Export Co., sailed for Europe Aug. 3 on the S. S. Caronia, to visit most of the European operations of General Motors and to attend the Paris automobile salon and the Olympia motor show in London. Mr. Tipper expects to return to America about Nov. 1.

Trone Now Jobber Executive

O. S. Trone has left the Manley Mfg. Co., where he was treasurer, to become vice-president and general manager of the Roper & Neagley Co., replacement parts jobbers of York, Pa., and Baltimore. Mr. Trone will extend the Roper & Neagley line into other fields, such as tools and other closely allied products.

McDarby Sees Record Half

N. E. McDarby, sales manager of Auburn, predicts that the last half of 1928 will be the greatest sales period in Automotive history. Mr. McDarby believes that more than \$1,500,000,000 worth of cars will be sold in this country between July 1 and Dec. 31.

White Given Cup by Daytona Citizens

J. M. White, owner and builder of the car in which Ray Keech established the world's automobile speed record of 207.55 miles an hour, was given a loving cup by the citizens of Daytona Beach, Fla., at a luncheon tendered in his honor by the Philadelphia Chamber of Commerce. The cup was presented by Mayor Armstrong of Daytona to Mayor Mackey of Philadelphia, who delivered the cup to Mr. White.

Coapman Back From Europe

C. Walter Coapman, treasurer of North East Service, Inc., Rochester, N. Y., has returned from a three-months' tour through England and Europe. While in Europe he visited the associate companies at London and Paris. He also visited many large distributors of North East products.

Chatfield Goes to Brazil

Daniel Chatfield, a member of the experimental department of Ford Motor Co., has been ordered to Brazil to help in laying out the Ford rubber plantations.

Rawson Back at Factory

R. A. Rawson, general sales manager of Moon Motor Co., has completed an extended trip through the East.

Gow Joins United Motors

William Gow, who was Studebaker service manager in New York for six years, has become temporary service manager for the city branch of United Motor Service, where he will serve for a few months preparatory to going to Detroit, where he will become service manager of that company, with headquarters in the General Motors Building. He has been in service work for 18 years.

Lucas District Manager

Milwaukee Motor Products Co. has appointed C. T. Lucas district manager of the Western States. Mr. Lucas was formerly with the Monark Battery Co.

W. L. Reinke, formerly with the Thermoid Rubber Co., will represent the company in the Central States.

Van Cleef Chicago Manager

E. E. Van Cleef has been appointed Chicago district sales agent by the Roller-Smith Co., New York. M. B. Mathley, who has been connected with the Chicago office for many years, will be associated with Mr. Van Cleef.

Skinner Named President

Robert A. Skinner of New York has been elected president of the Mitchell Specialty Co., Philadelphia, manufacturer of the Electrolock and automobile body hardware.

Wallace Goes to St. Louis

W. G. Wallace, vice-president of the Moon Motor Car Co., has been transferred from the Moon branch in New York City, where he was general manager, to the Moon factory in St. Louis.

Chrysler Takes Over Presidency of Dodge

Announcement of Consolidation of Offices Follows Stockholder Vote

NEW YORK, July 31—Consummation of the Chrysler-Dodge merger deal has been effected as a result of the Dodge Brothers stockholders' meeting held yesterday in Baltimore. Chrysler stockholders had already approved the deal. This consummation takes place after three postponements due to the previous failure of Dodge Brothers stockholders to deposit 90 per cent of all classes of stock.

The completion of this deal makes the Chrysler Corp. the second largest publicly owned company in the industry. According to the statement given out from Mr. Chrysler's office the joint permanent assets as of April 30, 1928, were approximately \$95,000,000, with working capital of \$80,000,000, and total resources of \$175,000,000. The combined distributor dealer organization numbers 12,000, the manufacturing capacity is 700,000 cars and trucks a year, resulting in a gross business of \$500,000,000 and a potential earning power of between \$40,000,000 and \$50,000,000. The new enterprise has a funded debt of \$61,000,000 and 4,420,000 shares of common stock selling in the market for about \$400,000,000 and will have 40,000 shareholders and 35,000 employees. The acquisition of Dodge Brothers will give Chrysler 18 plants.

The trade status of Dodge Brothers and its cars will remain unchanged, and announcements are being sent out to that effect to all Dodge dealers by J. E. Fields, vice-president in charge of sales of Chrysler.

Keller Manufacturing Head

Walter P. Chrysler will assume the position of president of the newly organized Dodge Bros. Corp. K. T. Keller, vice-president of Chrysler, will also be vice-president and general manager in charge of all manufacturing operations of Dodge plants. W. Ledyard Mitchell will remain vice-president and general manager of operations in charge of manufacturing of Chrysler, De Soto and Plymouth plants. Fred M. Zeder will be vice-president in charge of engineering for all divisions; J. E. Fields, vice-president in charge of sales for all divisions, and B. E. Hutchinson, vice-president in charge of finance and treasurer of all divisions.

Mr. Chrysler issued the following statement on the consummation of the deal:

"In assuming the ownership and management of the business and assets of Dodge Brothers, Inc., the Chrysler Corp. recognizes the real and implied obligations to the Dodge Brothers, Inc., dealers and car buyers, and welcomes into participation in ownership of Chrysler

Corp. those Dodge Brothers, Inc., shareholders who have voiced their confidence in Chrysler management through the deposits of their shares under the plan.

"With this enlarged operation supported by the splendid, modern, physical and mechanical facilities of Dodge Brothers, the Chrysler, Dodge, De Soto and Plymouth products can be offered to the consuming public with all the advantages of the most efficient production facilities and organization. But it is the confidence of the public in the fine product which Dodge Brothers have always built and the splendid organization which we value most highly.

"This step has not been actuated by any desire for more size but to develop the many advantages which the association of these two properties will inevitably accomplish in administrative, manufacturing and purchase economies. It also provides immediately increased facilities needed to care for the rapidly expanding Chrysler business.

Cites Operating Benefits

"Nowhere, possibly, save in the automobile manufacturing industry, have the benefits of large-scale operations been so fully realized, or so promptly passed along to the public through better values offered. Only the largest of units can at this stage of the development of the automobile industry, operate with the efficiency and economy required to fully develop the opportunities presented by the remarkable growth of the market, domestic and foreign, for automobiles.

"Chrysler Corp. intends to use every effort to conserve the world-wide good will of Dodge Brothers. In fostering ever higher quality and lower costs to the car buyer and in promoting pleasant and profitable relations with dealers it expects to sustain and steadily stimulate the earning power of the splendid, established enterprise.

"The Dodge Brothers factory organization has earned the reputation for producing automobiles of highest quality and workmanship. This splendid factory organization will continue to produce Dodge cars of the traditional Dodge value."

Open Airship Bids Aug. 9

WASHINGTON, Aug. 2—Bids for two rigid airships each of approximately 6,000,000 cu. ft. capacity, authorized by Congress in 1926 at a cost not to exceed \$4,500,000 for one or \$8,000,000 for both, will be opened by the Navy Department, Aug. 9. One bid had been received. Originally July 26 was set as the date for opening of bids but a postponement was made at the request of prospective bidders.

Foundry Company Builds

WAUKESHA, July 28—The Spring City Foundry Co., manufacturer of gray iron castings and specializing in automotive work, is building an addition to its plant costing about \$25,000.

Financial Notes

Peerless Motor Car Corp. and subsidiaries report net loss for the first six months of 1928 as \$597,528 as against profit of \$78,508, or 30 cents a share for the corresponding period last year. Net loss for the second quarter of the year is \$403,904 and compares with income of \$247,306 or 96 cents a share for the similar period last year.

Motor Bodies, Inc., body building subsidiary of Graham-Paige Motors Corp., has authorized increase of common stock from 1000 to 5000 shares, according to articles of reincorporation. Shares will have a par value of \$100 each. Stock issuance will raise capitalization from \$100,000 to \$500,000.

Baldwin Rubber Co., manufacturer of automobile floor mats, reports net earnings of \$128,073 after allowing for Federal taxes, for the first six months this year, or \$2.58 per share on the class "A" stock. Sales for the first half of the year set a new record.

American Bosch Magneto Corp. reports net profit for the first half of the current year as \$103,454 before taxes. This is equivalent to 49 cents a share on common stock and compares with \$80,466 or 39 cents a share for the same period last year.

Yellow Truck & Coach Mfg. Co. reports net sales for the first half of the current year as \$24,893,447. Before provision for depreciation, this represents net profit of \$251,865, but after depreciation, operations showed a net loss of \$207,588.

Brockway Motor Truck Corp. and Indiana Truck Corp. report for the six months ended June 30, net income of \$776,326 after depreciation and Federal taxes, comparing with \$536,144 in the first half last year.

National Acme Co. reports for the second quarter profit of \$193,136 after charges but before Federal taxes. This compares with \$197,967 in the preceding quarter and with \$44,624 in the same period last year.

Doehler Die Casting Co. reports profit for the first half year of \$431,204, before Federal taxes, this comparing with \$238,070 in the 1927 period. Sales for the first half totaled \$3,994,478 against \$3,524,998.

Westinghouse Air Brake Co. reports for the six months ended June 30 net income of \$2,930,350 after depreciation and Federal taxes, comparing with \$5,247,283 in the first six months last year.

Pierce Governor Co. reports net profit of \$125,852 for the six months ended June 30, equivalent to \$2.09 a share earned on the 60,000 shares of common stock outstanding.

Wire Wheel Corp. of America has declared a quarterly dividend on Class "A" preferred stock of \$1.75 payable Aug. 10 to stockholders of record Aug. 1.

Johns-Manville Corp. reports net income for the first half of the current year as \$2,373,144. Income for the second quarter was \$1,600,438.

Borg Warner Corp. reports net profit for the six months ended June 30 as \$2,304,300.

High July Sales Reduce Car Stocks

(Continued from page 170)

first half of the year but the expectancy is warranted by the continuing even demand, by the low condition of dealer stocks generally and by the amount of advance business now on factory books.

Reports from leading centers follow:

New York

Sales of both new and used cars have kept up well during July, comparing favorably not only with July of last year, but also with past performance of this year. Used car stocks are not oppressive. Price reductions in new cars have made competition for used cars harder, but dealers are in good position in both classes of cars. Sales during the first week in July were 4795, as compared with 3386 last year, according to Sherlock and Arnold.

Boston

Motor car sales for July were a shade better than in June. Those dealers who had new cars coming through received a big impetus to sales. That people really were waiting could be noted by the influx to salesrooms featuring new models. There has been a noticeable increase in the new Fords seen on the street, but some of the dealers in low priced cars continue getting canceled Ford orders, and now they wonder if they will be able to fill them. Used cars are not moving very fast and the big demand seems to be in the cheap class around \$100.

Cleveland

Interest created by new model announcements has kept automobile sales here at a high level during July. New car movements exceed those of the previous month and also excel the figure for July, 1927. Herbert Buckman, of the Cleveland Automobile Manufacturers & Dealers Association, reported. An equally active business is reported in the used car market.

Cincinnati

Following a record business for many lines in June, both new and used car demand set an unusually fast pace in July with every indication that final figures will show the midsummer business on a par with June totals. The most gratifying feature of conditions is the steady demand for used cars. The consensus is that present conditions will continue well into August. Parts and accessory jobbers and dealers also report business splendid, particularly in the equipment end.

St. Louis

Sales in the lower priced field have been good and about equal to sales during July, last year. Business in high priced cars is slow, however, the bulk of July volume being in cars selling for \$1,000 or less. Used car sales and stocks are reported as normal, while stocks of new cars are normal, except in some of the higher priced models, which are overstocked.

Detroit

Automobile sales in Michigan in July continued at a very satisfactory seasonal rate and indications are that excellent business will continue to prevail throughout the summer. Introduction of new

models by a number of makers has greatly stimulated buying. There has been a good market for used cars this year with a result that many dealers are finding themselves in a favorable position. Demand for light commercial vehicles continues strong.

Chicago

Retail sales of automobiles in July continued the upward swing started early in June, volume being estimated on the whole at approximately 15 per cent greater than June and 20 per cent greater than July, last year. New car stocks are unusually low; in many cases distributors and dealers are finding it hard to keep an adequate supply. Used car stocks are considered normal, despite the somewhat overstocked condition apparent a month to six weeks ago. Many dealers report used car stocks below normal.

Milwaukee

Passenger car dealers describe July business as relatively excellent, with a volume ahead of a year ago. Prospects for August are considered even better, with most of the 1929 models disclosed to public view and orders developing in a manner almost unexpectedly good. New car sales for the state of Wisconsin are still behind a year ago up to this time, but the margin is steadily being reduced by gains made in April, June and July. Local conditions are showing excellent improvement, numerous large manufacturing plants finding it necessary for the first time in more than a year to add capacity. Truck business is equal to a year ago. Automotive equipment is moving fairly well. Used cars, while moving rather slowly, show an improvement, especially when compared with a year ago.

Minneapolis

Any lapse from the totals of the automobile business in this territory thus far this year promises to be recouped and a gain added over last year when the sales for 1928 are figured. Lines have varied to date in the percentage of sales with reference to 1927. Some have made gains up to 30 per cent, but others have had less business. The average is fair. But the crop situation and the increased attendance for inspections of new models this summer by prospects gives promise of a full fall trade. The used car situation shows a general clean-up. Crops in North Dakota, usually a somewhat uncertain state until harvest, are already assured. Income of farmers in Montana, says the Federal Reserve bank, in 1927-28, was the largest for the state in the last five years. South Dakota almost equaled its previous high records for the period. Farmers are increasing purchases of tractors.

Denver

Dealers throughout this territory uniformly report the small car market as poorer than for this time last year, and slower than in June, this year. The market on larger cars is better than in July, 1927, but slower than last month. The used car market is better, and there are fewer used cars on hand than for some time, while payments are good and repossession few. Throughout the state the farmers are busy harvesting a wonderful

wheat crop, although the falling wheat market is not so promising.

Kansas City

Appearance of new models have stimulated automobile sales here in July with the general tone of business holding firm. Light car sales, while slowing down somewhat during the midsummer, have held up better than usual. Ford deliveries have increased, but dealers still are well behind the orders. The used car situation continues good with 50 per cent fewer used cars in the hands of dealers than usual at this period. The marketing of the bumper wheat crop in Kansas and Oklahoma boosting sales throughout the territory served from Kansas City.

New Orleans

Improvement in general automotive conditions in this vicinity is due to certainty of large sums being spent here for flood control. The used car situation is good. Governor Long has announced vast programs for paved highways in this state, which is certain to help the industry. The trend away from heavy to light trucks is increasing. Ford sales have not cut sales of other light cars noticeably here as yet.

Dallas

Automotive business, except for the grain belts, slumped slightly in July. Sales in the grain belts showed an increase over June and were up to the mark set one year ago. Dealers and jobbers expect to see a quickening of business generally in August. Actual sale of new cars in July 4 per cent below those of June and some 4 per cent lower than for same month a year ago. New car stocks in dealer hands normal. Used car sales, 6 per cent below June and 7 per cent lower than July a year ago. Dealer's stocks are heavy. Truck sales fine in grain belts.

San Francisco

July sales in this territory are about 8 per cent ahead of June and 12 per cent ahead of July, last year. Rebuilt used cars are selling well, and are estimated at 20 per cent better than July a year ago. Trucks up to two tons are moving rapidly, owing to large crops. General business conditions are improving with collections about 8 per cent better than in June.

Los Angeles

July sales continue to reflect generally slower business condition in this territory, with decrease of about 20 per cent from July of last year, and 10 per cent decrease from last month. Stocks in dealers hands are slightly higher than last year. Used cars continue to move well. The truck market is showing considerable decrease from last year.

Seattle

Retail car sales for July were approximately 15 per cent under sales for June, and somewhat under the sales for the same month of 1927. Dealers report that car sales for the first seven months of 1928 will be approximately 10 per cent under the first seven months of 1927. Stocks are ample for practically all requirements. The used car market continues in excellent shape, and business conditions generally, for the Pacific Northwest, are very good.

Exports, Imports and Reimports of the Automotive Industry for June of Current Year and Total for Six Months Ending June, 1928

	1927		1928		1927		1928	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobile parts and accessories.....	..	\$29,032,595	..	\$43,801,242	..	\$212,086,350	..	\$248,630,398
Electric trucks and passenger cars.....	9	15,949	9	11,981	56	80,135	81	98,316
Motor trucks and buses, except elec. (total).....	6,814	4,472,031	11,133	7,449,834	54,748	34,562,184	58,957	40,868,474
Up to 1 ton, inclusive.....	5,520	2,556,839	8,481	4,484,251	45,726	20,971,057	45,139	23,395,252
Over 1 up to 2 1/2 tons.....	1,149	1,524,736	2,419	2,282,407	7,883	10,226,328	12,210	13,443,761
Over 2 1/2 tons.....	145	390,456	233	683,176	1,139	3,364,799	1,608	4,029,461
PASSENGER CARS								
Passenger cars, except electric (total).....	20,820	16,062,190	36,038	24,536,191	159,781	117,156,945	194,309	140,224,661
Value up to \$500, inclusive.....	2,955	1,079,694	..	..	41,174	15,279,029	..	..
Value from \$500 to \$800.....	8,145	4,613,092	..	..	54,376	31,537,427	..	..
Value from \$800 to \$1,200.....	6,273	5,267,348	..	..	42,827	37,679,765	..	..
Value from \$1,200 to \$2,000.....	2,665	3,290,909	..	..	16,558	20,854,876	..	..
Value over \$2,000.....	782	1,811,147	..	..	4,846	11,805,848	..	..
PARTS, ETC.								
Parts, except engines and tires.....	..	..	..	..	..	..	..	..
Automobile unit assemblies.....	..	3,306,674	..	4,918,660	..	26,152,609	..	29,645,376
Automobile parts for replacement.....	..	3,438,099	..	4,794,873	..	22,614,200	..	25,087,990
Automobile accessories.....	..	670,893	..	972,764	..	4,390,555	..	4,712,375
Automobile service appliances (n. e. s.).....	..	736,355	..	752,601	..	4,254,386	..	3,823,127
Trailers.....	52	20,648	58	11,692	465	201,345	350	142,338
Airplanes, seaplanes and other aircraft.....	1	3,445	7	108,195	19	311,610	87	940,917
Parts of airplanes, except engines and tires.....	..	78,437	..	107,005	..	189,178	..	527,095
BICYCLES, ETC.								
Bicycles and tricycles.....	353	10,291	406	11,680	2,210	63,694	2,630	76,460
Motorcycles.....	1,454	316,315	1,341	305,361	11,089	2,476,518	10,412	2,415,152
Parts, except tires.....	..	102,648	..	123,111	..	688,735	..	731,756
INTERNAL COMBUSTION ENGINES								
Stationary and Portable								
Diesel and Semi-Diesel.....	88	142,887	28	183,416	392	713,722	321	551,515
Other stationary and portable:								
Not over 10 Hp.....	1,453	139,258	2,921	257,663	13,780	1,180,884	17,908	1,553,498
Over 10 Hp.....	119	110,647	747	265,120	778	753,051	1,833	744,977
Automobile engines for:								
Motor trucks and buses.....	713	102,241	1,061	97,316	3,407	395,847	7,041	730,474
Passenger cars.....	8,182	964,518	10,571	1,019,623	65,908	6,733,875	69,891	7,262,732
Tractors.....	3	1,545	8	4,446	789	365,189	244	67,952
Aircraft.....	1	3,445	7	108,195	19	311,610	87	940,917
Accessories and parts (carburetors).....	..	322,316	..	378,075	..	1,992,018	..	1,949,724
IMPORTS								
Automobiles and chassis (dutiable).....	52	121,534	36	91,496	281	548,008	220	546,396
Other vehicles and parts for them (dutiable).....	..	9,431	..	66,965	..	94,411	..	272,798
REIMPORTS								
Automobiles (free from duty).....	8	9,165	9	13,745	96	150,771	131	137,543

Rubber Stock Estimated 75,000 Tons November 1

NEW YORK, July 30—Crude rubber stocks on Malayan estates amount to 44,791 tons with stocks in the hands of dealers placed at 13,536 tons, according to cable advices received by the F. R. Henderson Corp. This company points out that it is unlikely that there will be more than 75,000 tons unshipped at the time restriction is removed on Nov. 1, and that this will not reach this market before the end of the year. It is their opinion, therefore, that the removal of restriction can have no effect on this year's market, and that present prices are unwarrantably low. The ultimate release of this rubber is making its effect felt in forward positions, however, there being reported a marked tendency to sell next year's deliveries against purchases for this year.

Trading on the New York market seems not to be reacting to these figures to any great extent, however, although Henderson notes a firm undertone.

Takes Over Speedcrane

MANITOWOC, WIS., July 28—The Manitowoc Engineering Works, Manitowoc, Wis., a division of the Manitowoc Ship Building Corp., has taken over the entire manufacturing rights to the Moore Speedcrane, a gas-powered machine mounted on a crawler type chassis, which is convertible to shovel, crane, trench-hoe or dragline. The former manufacturer, the Moore Speedcrane Co., Chicago, will continue as dis-

tributor of the machine, together with Forsythe Bros., New York, Eastern sales agent. The Moore Speedcrane is built on the gear-shift principle.

Increased Freight Rates Deferred by Railroads

NEW YORK, July 31—Executives of western railroads have informed the National Automobile Chamber of Commerce that no further action will be taken at this time toward increasing the freight charges on western shipments, excepting 10 per cent on coast shipments. Objections were made to the proposed increase at a special meeting of traffic managers in Chicago in April.

A similar proposal by the southern lines is still in abeyance. The N.A.C.C. is making a study of automobile shipments to the South, which will cover more than 6000 carloads to southern destinations, and will disclose ton-mile earnings, car-mile earnings, average length of haul, average value per carload, and other pertinent facts.

Victory Sport Touring Added

DETROIT, July 30—Dodge Brothers, Inc., has added a sport touring car to the Victory Six line. Six wire wheels will be standard equipment. The spares are carried on the sides of the car in fender wells, and a trunk rack is at the rear. Lights, bumpers and all trimmings and hardware are to be nickel plated. Four hydraulic shock absorbers and internal expanding hydraulic brakes are included in the price of \$1,245.

Revised Income Tax Forms Now Ready for Fiscal Year

WASHINGTON, Aug. 2—Revised forms for income tax returns of automobile manufacturing and other corporations closing their fiscal year in 1928 are ready for distribution at offices of collectors of internal revenue and branch offices, it was announced by the Bureau of Internal Revenue.

The new form makes provision for reporting income at the new rate of 12 per cent which is in lieu of the old rate of 13 1/2 per cent and for the \$3,000 exemption instead of the former \$2,000 exemption. Corporations which have already filed their returns for the fiscal year 1928 on the old schedule form and attached to it a schedule on which the tax is computed correctly under the Revenue Act of 1928 are not required to file an amended return.

Durant Offers Broughams

NEW YORK, July 28—Durant Motors, Inc., has introduced two new four-door broughams and a four-door sedan on the "55" six-cylinder chassis. The first four-door brougham comes in two colors, royal blue and ambatto green, both harmoniously striped and finished. This car lists at \$695. The other brougham is a de luxe model and is supplied in Labrador smoke, a rich tan color, striped in contrasting color. This car is equipped with five black wire wheels, bumpers and bumperettes and is priced \$750. The six-cylinder sedan is deep French gray in color and sells at \$895.

Higher Price Levels Aim of Steel Mills

Semi-Finished Material Slated for Increase in Year's Final Quarter

NEW YORK, Aug. 2—Efforts on the part of producers to lift steel prices to slightly higher levels for fourth quarter are becoming more pronounced. Prices for semi-finished material—billets, slabs and sheet bars, are slated for an advance for fourth quarter. While it is quite likely that sheet-rollers and strip-mills will have every opportunity to cover their September requirements at the prevailing price of \$32, Pittsburgh, producers of semi-finished material hope that, when it is understood that higher prices will prevail for fourth quarter, rollers will take this fact into consideration in their attitude toward fourth quarter sheet and strip business that may be offered them.

Plans to give to the steel market's price structure greater firmness during the year's last quarter depend for their consummation upon good demand. Should there ensue a pronounced lull in specifications from now on, when steel consumption normally is expected to show an upward trend, the program may have to be considerably modified. While the 1.85 cents, Pittsburgh, price for hot-rolled steel bars has not entirely disappeared, leading bar mills adhere more closely to the 1.90 cents quotation on new business. Producers of cold-finished bars are naturally more reserved about booking heavy tonnages at the 2.10 cents, Pittsburgh, price.

The market for strip-steel continues highly competitive, with the automotive demand close to two-thirds of the entire output. According to authorities, automotive demand for strip steel has resulted in an increase of 25 per cent in production over the first half of last year. Mills continue to consider each order upon the attractiveness of the specifications involved. Where extras afford a fairly wide margin, base prices are likely to be very closely trimmed. Considering the season and stock-taking period in some automotive plants, mills specializing in automotive alloy steels fare very nicely. Bolts and nuts are in light demand.

Pig Iron—The market is marking time. Automotive foundries are apparently waiting for more definite developments before committing themselves for fourth quarter.

Aluminum—While devoid of new developments, the market continues to be featured by a very satisfactory demand from automotive consumers, much better than had been expected earlier in the year. Prices for primary metal continue unchanged. Remelted aluminum rules fairly easy at unchanged prices.

Copper—Consumers are showing more interest in September deliveries. Producers are in absolute command of the situation, and there is little question about prices being maintained until a broader demand makes itself felt.

Tin—The market continues to recuperate, and is now in much better condition than a month ago. Considerable speculation is in evidence in London, but the advances that have been recorded since the year's low of 45½ cents was reached on June 21, have been a natural reaction from this extreme.

Lead—The market continues to rule firm at unchanged price levels. Announcement is made of the formation of the Lead Industries Association, to promote the interests of both producers and consumers.

Zinc—Producers continue to hold at 6.25 cents East St. Louis. Demand is light.

Alcohol Institute Reduces Inventories 48 Per Cent

NEW YORK, July 31—The Industrial Alcohol Institute has just completed a survey of its accomplishments. It was found that the institute had done valuable work in educating the public in new and legitimate uses of commercial alcohol, as well as reducing the combined inventories of its members 48 per cent from June 30, 1927, to June 30, 1928.

The 14 members of the institute have a combined capitalization of over \$100,000,000, and produce 97 per cent of the 85,000,000 gal. of industrial alcohol the government has set as the maximum quantity that may be produced in 1928. Uses for industrial alcohol have been found in increasing number.

Third French Gasoline Substitute Tour Shows Reduction in Fuels Demonstrated

PARIS, July 17 (by mail)—Twenty-automobile trucks consuming all kinds of home produced fuels left Paris last week on a 1000-mile demonstration through northern France, Belgium and the east of France. They will remain absent 16 days, during which time they will endeavor to demonstrate the practicability of national substitutes for foreign gasoline and to arouse public interest in the use of these substitutes.

The demonstration is organized by the Automobile Clubs of France and Belgium, with assistance from the governments of the two countries, and is the third of its kind to be held. The number of substitute fuels is rather less than a year ago, for several proposed fuels have been withdrawn because of cost. Producer gas trucks employing wood charcoal either in its natural condition or in a compressed form are in a majority. There are also two trucks with this type of plant making use of compressed peat.

The charcoal gas plant has proved its value to such an extent that some of the biggest truck makers do not think it necessary to take part in a demonstration of this nature. The leading firms running in this division are Panhard Levassor, Renault and Willeme, this last method using the American Liberty 7-ton truck fitted with a Rex gas plant.

A Somua motor bus is running with the Peugeot-Junkers twin-cylinder two-

New Yellow Coach Has Cadillac Engine

Model Has Hydraulic Four- Wheel Brakes—Two Types of Bodies Available

DETROIT, July 30—An eight-cylinder motor coach, designated Type W, is the latest addition to the line of Yellow Coaches produced by General Motors Truck Co. The powerplant is a Cadillac V-type engine, bore 3 5/16 in. stroke 4 15/16 in., modified for coach service. The transmission line includes a multiple disk clutch, four-speed transmission and semi-floating underslung worm-driven rear axle. Hydraulically operated four-wheel brakes, with four shoes in each drum, are used for service and the hand brake is of the contracting type operating on twin drums mounted on either side of the propeller shaft center bearing. The front springs are mounted outside the frame side-rails and are shackled at the front, the lower end of the shackle being attached to a cross member at the front of the frame.

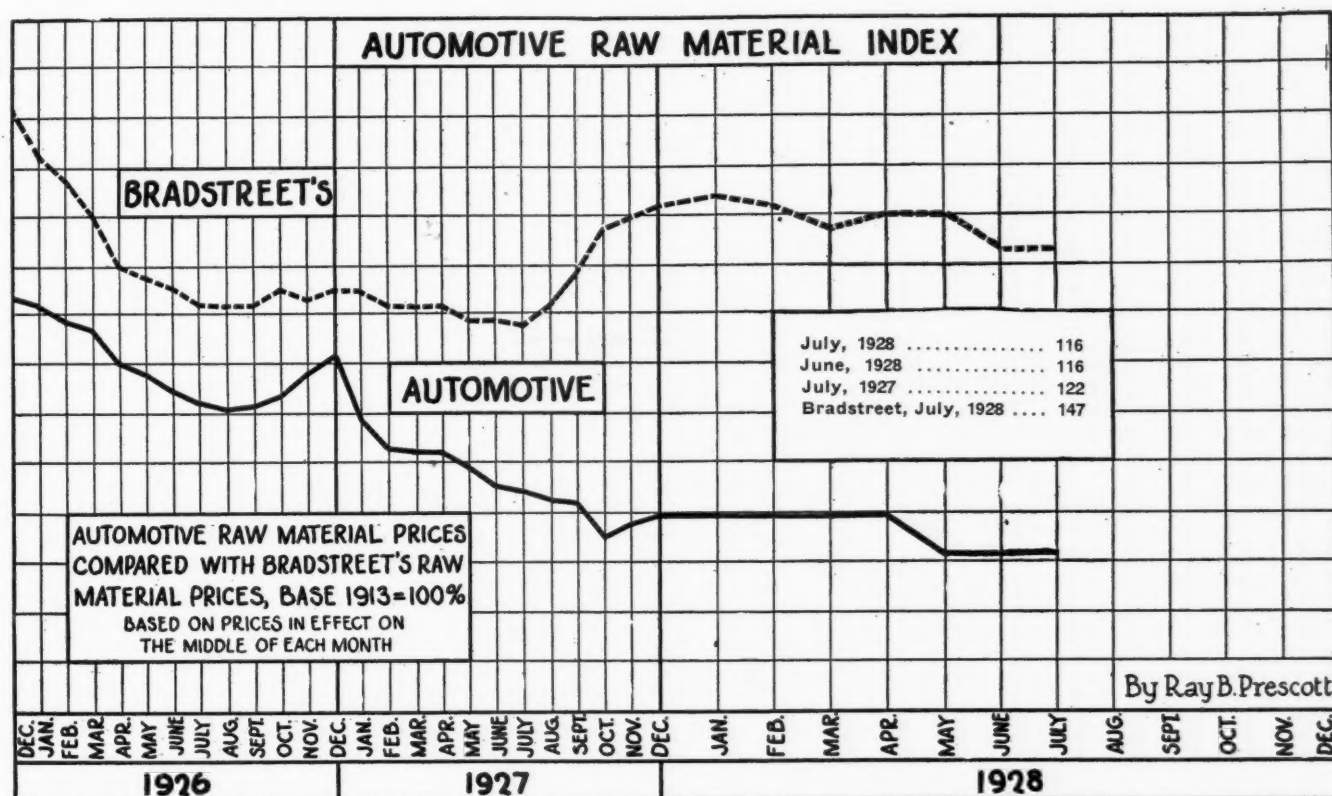
Parlor coach and city service bodies are available.

stroke Diesel engine built by a branch of the Peugeot organization. The engine consumes crude oil, and the vehicle has proved that it has a speed and general performance equal to that of a gasoline coach.

The Paris bus company is demonstrating the use of methane gas compressed into bottles carried under the overhang of the body, between the front and rear wheels. One of the features of this demonstration is the use of light steel bottles bound both longitudinally and transversely by piano cord. These bottles are 50 per cent lighter than those used normally for oxygen, hydrogen and carbonic acid gas, and are said to have a very much greater resistance, for the ordinary drawn steel bottle is tested up to 4270 lb. per sq. in., while the piano cord has a resistance up to 158 tons per sq. in. The gas is compressed to about 2840 lb. per sq. in. and is delivered to the engine through a reducing valve. A truck and trailer, the former running on methane gas, accompany this demonstration and are fitted with a compressor plant used for fitting the bottles for the buses.

Among the various types of liquid fuels are benzol, which is being demonstrated by one of the Paris gas companies, wood alcohol and various mixtures of alcohol with gasoline and benzol. While satisfactory from a technical standpoint, these liquid fuels cost more than imported gasoline.

Raw Material Prices Hold June Level



Rubber Imports Total 208,874 Tons in 1st Half

WASHINGTON, Aug. 2—The United States imported 208,874 tons of rubber during the six months ended June, 1928, the total value of the imports being \$149,680,913, according to preliminary figures made public by the Department of Commerce.

British Malaya furnished 118,055 tons valued at \$84,800,964; the United Kingdom furnished 28,165 tons valued at \$19,760,291; Java and Madura supplied 19,389 tons valued at \$14,330,291; other East Indies (Netherlands) shipped 17,582 tons valued at \$13,264,345 and Ceylon shipped 16,130 tons valued at \$12,340,703. From Brazil came 8544 tons valued at \$3,348,583 and the remainder was from the scattered spots of the world.

Cuba Creates Luxury Tax

WASHINGTON, Aug. 2—The President of Cuba has approved a new law, effective immediately, creating special luxury taxes which include a \$20 tax on every passenger automobile, the Department of Commerce is informed. Proceeds of the tax, it is reported, will go to tuberculosis hospitals and other institutions of public benefaction.

A. O. Smith to Build

MILWAUKEE, July 28—Dimensions of the new shop unit which the A. O. Smith Corp. will build immediately are 720 x 280 ft. It will be of brick and

steel and requires 2500 tons of structural shapes, to be fabricated and erected by the Wisconsin Bridge & Iron Co., Milwaukee. The cost is estimated at \$450,000 to \$500,000. E. W. Burgess is construction engineer.

Henney Company to Buy Weatherproof Body Corp.

CHICAGO, July 28—Stockholders of the Henney Motor Co. will meet at Freeport, Ill., Aug. 14 to ratify a proposal to acquire the Weatherproof Body Corp. and an increase in the authorized capitalization from 100,000 shares of common stock to 125,000 shares and the preferred from 25,000 shares to 50,000 shares.

The plan provides for the issuance of 8000 additional shares of \$4 dividend preferred stock and both the common and preferred stockholders will receive rights to subscribe for common stock at \$18 a share, in the ratio of one share of additional common for each six shares of preferred and common now outstanding.

Shipments to England Drop

WASHINGTON, Aug. 2—England imported 7026 passenger cars and 6785 chassis from January to May, inclusive, 1928, the Department of Commerce is informed. This showed a considerable drop in passenger car imports and a slight increase in chassis imports as compared with the same period of 1927 when England took 10,648 passenger cars and 6239 chassis.

Retail Trade Increases in First Half of Year

WASHINGTON, Aug. 2—The volume of retail trade in all lines except cigars showed a substantial increase during June, over June, 1927, the seasonal decline being smaller, according to the Federal Reserve Board's monthly survey, just issued. Similarly, the first six months of 1928 in the retail trade showed satisfactory increases over the same period in 1927. During June, 1928, mail order houses did 19 per cent more business than in June, 1927; and during the first six months of 1928 this retail trade was 6.4 greater than during the first six months of 1927. Five and 10-cent stores, chain apparel stores and chain drug stores also showed healthy increases.

Stutz Adds Coupe at \$3,990

INDIANAPOLIS, July 28—A five-passenger two-door coupe mounted on the 131-in. wheelbase chassis has just been announced by the Stutz Motor Car Co. of America, Inc. The car is priced at \$3,990. The rear seat is full width while the front seats are divided and tilt forward. The body is of aluminum and is available in optional lacquer trims. Interior trimming follows closely that of other closed models of the Stutz line and the same equipment is supplied. A trunk is fitted on the rear deck and the two spare wire wheels and tires are mounted in front fender wells.

3 Chryslers Place in Belgian Feature

PARIS, July 10 (by mail)—Chrysler cars finished second and third in the Belgian Grand Prix 24-hour race held on a hilly and winding road circuit near Spa. The Chrysler driven by De Vere and Mangin covered a distance of 1386.5 miles, thus averaging 57.7 m.p.h., while the one driven by Zehender and Ledure covered a distance of 1368 miles. Another Chrysler, driven by Stoffel and Rossignol finished sixth with a distance of 1266.3 miles.

The race was won by Ivanowski and Marinoni, driving a 91½ in. supercharged Alfa Romeo, with which they covered a distance of 1531 miles, equivalent to 63.8 m.p.h., or 145 miles more than the nearest competitor, and bettering the previous record, established by a Peugeot in 1926, by 106 miles.

An Auburn was entered in this race by the Belgian distributor. After 14 hours' running, Dubois, the driver of this car, collided with the rear of a George Irat, while both were going at speed, and as a result ran into a tree, with serious injuries to himself.

30 Cars Start in Race

There were 30 starters in the race, which was limited to cars in regular production. For a time competition was keen between the Alfa Romeo and two Bugattis, but after the latter had been destroyed by fire, the Italian car secured a substantial lead and was never threatened by the others.

The Alfa Romeo has a six-cylinder engine of 62 by 82 mm. bore and stroke, with two overhead camshafts driven by gearing from the rear. The crankshaft is carried in five bearings, one of these being behind the timing gear. Between the two camshaft pinions is an idler pinion on which a spring operates as a brake to eliminate backlash when running slowly.

Coming Feature Issue of Chilton Class Journal Publications

Oct. 10—Marketing Annual for
1929—Motor World Whole-
sale.

Australian Rail Losses May Raise Car Tariffs

NEW YORK, July 28—Possibilities of higher tariffs against American-made cars in Australia, because of the loss of traffic by the government-owned steam and electric railways, are pointed out by Frank Delandro, Hudson-Essex dealer in North Sydney, New South Wales, who is in this country studying American methods. Opposition to this move is taking form among such organizations as the Motor Traders Association of Sydney, who are working diligently to prevent the increase of such tariffs.

Mr. Delandro is here to make a study of American service methods, paying particular attention to brake and closely related service and expects to remain some months. He expressed himself as vastly impressed with our American car and parts factories and says that he will return to Australia a much greater enthusiast for American cars than ever.

Kearney & Trecker Builds

MILWAUKEE, July 28—The Kearney & Trecker Corp., manufacturer of milling machines and other metal-working tools widely used in the automotive industries, has started work on a two-story shop addition, 75 x 72 ft. The plant was enlarged several months ago to relieve the crowded condition surrounding production, but the demand is such that further expansion of facilities is necessary. The plant has been running on overtime schedules for more than a year.

N.A.C.C. to Increase Foreign Trade Staff

NEW YORK, July 28—Foreign trade in automobiles has increased to such an extent that more definite recognition of its importance to the industry was taken at the directors' meeting of the National Automobile Chamber of Commerce held at South Bend, Ind., last week. It was announced at that meeting that two permanent representatives of the chamber for foreign territories would be appointed in the near future, one to be domiciled in South America and the other in Europe. It has not yet been decided who will hold these two positions.

It was also decided at this meeting that the field force of the foreign trade department of the N.A.C.C. was to be enhanced by the addition of another man or two. These positions likewise are not yet filled.

Iraq Lowers Truck Duty

WASHINGTON, July 28—Reduction of the import duty on motor trucks from 20 per cent ad valorem to 11 per cent ad valorem in Iraq, is announced in a cablegram from Bagdad to the Department of Commerce. The reduction is the result of a new customs tariff and includes all motor vehicles designed for conveyance of goods but not for passengers, and all distinctive or other component parts of such vehicles. The duty on passenger cars, motor vessel and motorcycles and parts will remain at the previous rate of 20 per cent ad valorem.

Hudson Gains in St. Louis

ST. LOUIS, Aug. 1—Hudson-Essex sales during June were the heaviest of any month in the history of the Hudson-Frampton Motor Car Co., St. Louis distributor, officials have announced. Hudson sales during June were 246 per cent greater than in May.

Calendar of Coming Events

SHOWS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-23
American Road Builders Association, Inc., Cleveland Auditorium...Jan. 14-19
American Society for Steel Treating, Commercial Museum, Philadelphia...Oct. 8-12
American Welding Society, Commercial Museum, Philadelphia...Oct. 8-12
Automotive Equipment Association, Coliseum, Chicago...Oct. 22-27
Berlin...Nov. 8-18
Brussels...Dec. 8-19
Buenos Aires...Nov. 29-Dec. 9
Chicago, National, Coliseum, Jan. 26-Feb. 2
Leipzig...Aug. 26-Sept. 1
London, passenger cars...Oct. 11-20
Montevideo...Nov. 10-19
National Standard Parts Association, Cleveland Auditorium...Oct. 29-Nov. 3
*New York, National, Grand Central Palace...Jan. 5-12
Paris, passenger cars...Oct. 4-14
Paris, trucks...Nov. 15-25
Prague...Sept. 1-9
Salon, Automobile Salon, Inc., Hotel Drake, Chicago...Jan. 26-Feb. 2
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles...Feb. 9-16

* Will have special shop equipment exhibit.

Salon, Automobile Salon, Inc., Hotel Commodore, New York...Dec. 2-8
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco...Feb. 23-Mar. 2
Toronto, Can.Aug. 24-Sept. 8

CONVENTIONS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
American Gear Manufacturers Association, Statler Hotel, Buffalo, N. Y.Oct. 11-13
American Institute of Mining and Metallurgical Engineering, Benjamin Franklin Hotel...Oct. 8-12
American Road Builders Ass'n, Inc., Cleveland Auditorium...Jan. 14-19
American Society for Steel Treating, Commercial Museum, Philadelphia...Oct. 8-12
American Welding Society, Commercial Museum, Philadelphia...Oct. 8-12
Automotive Equipment Association, Coliseum, Chicago...Oct. 22-27
National Highway Congress, Mexico City...Oct. 3-6
National Safety Council, National Congress, New York...Oct. 1-5
National Standard Parts Association, Hollenden Hotel, Cleveland...Oct. 29-Nov. 3

Society of Industrial Engineers, Rochester, N. Y.Oct. 17-19
World Motor Transport Congress, Rome...Sept. 25-29

A. S. M. E.

Cincinnati, Oct. 22-25—Machine Shop Practice.
Cleveland, Sept. 17-20—Fuels.

S. A. E.

National

Chicago, Dec. 6-7—Aeronautic.
Detroit, Book-Cadillac, Nov. 22-23—Production.
Detroit, Book-Cadillac, Jan. 15-18—Annual.
Los Angeles, Sept. 13-14—Aeronautic.
Newark, Robert Treat Hotel, Oct. 16-18—Transportation.
New York, Hotel Astor, Jan. 10—Annual Dinner.

RACES

Altoona...Aug. 18
Belgium...Aug. 12
Great Britain...Sept. 22
Italy...Sept. 2
Salem...Oct. 12
Syracuse...Sept. 1